

In Norge Executive Staff Transfers



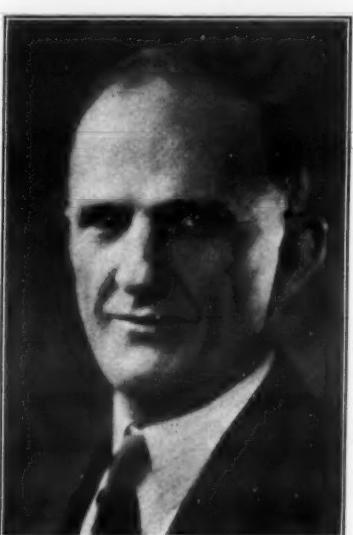
GEORGE BOEDDENER



GEORGE McINTYRE



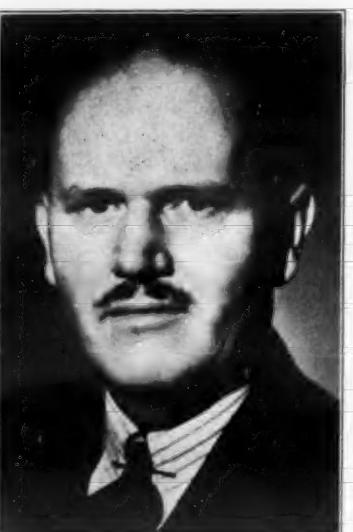
PAUL PUFFER



R. E. DENSMORE



W. H. DENNISON



CHARLES MACMAHON

Many Divisions Affected By Norge Staff Shifts

(Concluded from Page 1, Column 2)
U. S. Rubber Co. and with G & J Tire Co.

George McIntyre, vice president of Borg-Warner, has been appointed director of a newly created special department to cooperate with utility companies and their distributing organizations in further development of the appliance business.

Mr. McIntyre will continue to handle relations of the Norge division with the federal government, large insurance companies, and other quantity buyers of Norge products.

Prior to his association with Norge, Mr. McIntyre was with Kelvinator Corp., Commercial Credit Co., and Beneficial Industrial Loan Corp. and affiliated companies.

E. R. Lovgren, formerly Norge district manager with headquarters at Chicago, will head the new educational division, which will assist distributors and dealers in training retail salesmen. William B. Burruss of New York City has been retained as special sales consultant.

Aim of the division's activity will be not only to help the salesman to realize his personal opportunity to profit, but also to help him better understand the product he is selling, and to realize the needs and wants of consumers.

Mr. Burruss, who for several years has been sales consultant to the National Automobile Dealers'

Association, also has been sales analyst for American Automobile Association, Owens Bottle Co., Frederick Stearns & Co., Swift & Co., Ford Motor Co., and General Motors Corp.

His talk on "Shakespeare, the Salesman" has been delivered more than 1,200 times before a quarter of a million salesmen, it is said. Training meetings in several cities have been scheduled for January and February.

Charles H. MacMahon, former divisional sales manager for another Borg-Warner division, has been appointed national sales manager of Norge's range department.

George Boeddener has been appointed sales manager of the Norge heating and conditioning division, his first association with the company. Previously, Mr. Boeddener had been active for 20 years in jobber-dealer distribution of heating equipment, and was general sales manager for Fox Furnace Co., Elyria, Ohio, subsidiary of American Radiator & Standard Sanitary Corp.

R. E. Densmore has been promoted to the position of general field sales manager of Norge division, and Paul H. Puffer has become domestic refrigeration sales manager, succeeding Mr. Densmore.

Mr. Puffer was district manager for Norge in the Chicago territory before his promotion.

Jack Seekamp, product specialist with Norge, has been appointed department store sales representative.

Oakland Dealers Use Appraisal Sheet, Standard Credit Policy to Get Fair Trade

(Concluded from Page 1, Column 3)
against future chiseling, and a report of his violation is submitted to the manufacturer of the merchandise involved in the attempted unfair selling practices.

If caught a second time, the dealer is again warned, this time as an ultimatum, and another report is sent to the manufacturer. On a third offense, the association insists that the manufacturer refuse to sell the dealer any more appliances.

TRADE-IN APPRAISAL SHEET

To simplify the trade-in problem, the association furnishes every dealer and salesman authorized to make appraisals with a printed appraisal sheet.

This sheet presents two trade-in tables, one covering ice boxes, the other used electric and gas refrigerators. Prices listed are the maximum allowances set by the association, and it is expected that appraisals will be below this maximum figure.

In the ice box schedule, the boxes are classified as top and side icers. Allowances listed for top icers pertain to sales of all refrigerators. Allowances listed for side icers are subdivided into two sections, one covering sales of refrigerators with net cash price under \$140, the other covering sales of units \$140 and over.

Range of ice box allowances is from \$2.50 for top icers with enamel interiors to \$13.50 for metal 100-lb. side icers with porcelain interiors on

refrigerators costing \$140 or more.

In the table of maximum allowances for electric and gas refrigerators, the units are classified according to age and capacity.

Capacities range from three to 12 cu. ft., and ages from one year to six years and over.

For full porcelain refrigerators, 10% is added to the listed trade-in allowances. For "economy" boxes, 15% is deducted.

Following is an excerpt from the cross-index table:

Cubic Feet Capacity	3	4	5
1 year old.....	\$40	\$55	\$65
2 years old.....	36	50	58
3 years old.....	30	40	48

Lowest maximum allowance listed is \$10 for a 3-ft. unit six years old or over. Highest maximum trade-in allowance is \$130 for a one-year-old 12-cu. ft. box.

The association's appraisal sheet also contains a list of seven instructions to appraisers, and excerpts from the California Fair Trade Act, the California Fair Trade Practices Act, and from the opinion of Attorney General U. S. Webb presented Sept. 17, 1935, in a test case.

STANDARD CREDIT POLICY

The standard community credit policy now enforced in Oakland was jointly developed by the Appliance Dealers Protective Association and the Retail Credit Men's Association.

The policy specifically governs advertising of credit terms, and does not officially pertain to practice.

Following are the six terms of the policy to which the signers agree:

1. Not to use the phrase "no down payment" or any variant of it in any advertising, unless such use has been authorized for a special joint promotion by a majority of the parties to the agreement.

2. Not to advertise any credit period longer than 24 months.

3. Not to advertise monthly payments on any merchandise which shall be less than 1/24 of the cash price of the merchandise plus sales tax and carrying charge, at the usual rate in this community.

4. When any down payment is mentioned in advertising, the minimum amount shall be \$5 or 5%.

5. Not to use any phrases in advertising claiming or implying "more liberal credit terms" than can be obtained elsewhere.

6. To clear any disputed or questionable operation under this agreement through the secretary of the Retail Merchants Association, and to do no doubtful advertising until such clearance be had.

The agreement does not cover FHA financing, but where merchandise is to be so financed, this fact has to be stated in the advertising.

The association's original membership consisted of about 25 of the larger dealerships in the city. Educational bulletins were distributed among the rest of the retail appliance outlets to build up interest in a unified fair-trade group, and a field representative followed up the bulletins by soliciting members.

Guy W. Wolf is secretary of the association.

ROCKEFELLER CENTER . . .

**The Greatest
"City within a City"
The world has
ever known . . .**

USES CONTROLS

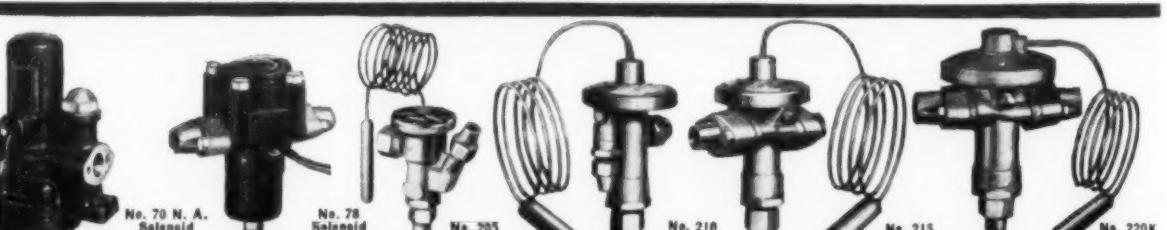
1. 70-story RCA Building
2. La Maison Francaise
3. British Empire Building
4. 41-story International Building
5. Palazzo d'Italia
6. International Building East
7. Radio City Music Hall
8. 31-story RKO Building
9. 36-story Nine Rockefeller Plaza Building
10. Center Theater

Go to Your Jobber for Your Controls . . .

Tribute to the unfaltering courage, faith and foresight of a great man, the Rockefeller Center will take its place as one of the Age's greatest miracles, a wonderful example of modern design and craftsmanship, a living monument to the co-operation between those two great constructive forces, American Management and American Labor.

The responsibility for mechanical operation in every one of these buildings is an enormous one. Air Conditioning and Refrigeration equipment alone runs into hundreds of thousands of

• Progressive Jobbers Everywhere Stock A-P Controls •



AUTOMATIC PRODUCTS COMPANY
2450 NORTH THIRTY - SECOND STREET
MILWAUKEE WISCONSIN

Air Conditioning & Refrigeration News

The Newspaper of the Industry

VOL. 23, NO. 3, SERIAL NO. 461
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DETROIT, MICHIGAN, JANUARY 19, 1938

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FOUR DOLLARS PER YEAR
TWENTY CENTS PER COPY

Westinghouse Opens Program On Home Units

Company Plans in All-Year Comfort Field Based On Broad Survey

MANSFIELD—What Westinghouse hopes to do in the residential air-conditioning field, and the plans and policies through which it means to achieve its objective, were outlined to distributors and dealers from the Central and Middle Atlantic districts during the company's first annual meeting on residential conditioning at merchandising headquarters here last week.

The company is breaking into the market in the Central and Middle Atlantic districts with its winter residential systems, it was explained, because the first territory represents an especially active market for gas-fired units, while the latter is just as partial to oil-fired equipment. Sales efforts in these two fields will be studied before full national distribution is attempted.

During their two-day meeting, the distributors and dealers absorbed the complete story of the company's new winter conditioning equipment, its sales features, and the advertising campaign back of it, as well as a simplified short course in application engineering.

Explaining the why and how of Westinghouse's entry into the residential conditioning field, William Hull Stangle, manager of home air-conditioning activities for the company, revealed for the first time the results of an exhaustive and comprehensive survey of the existing market, and outlined the sales, engineering, and advertising policies of the newly created department.

In his address, highlight of the meeting, Mr. Stangle pointed to an estimated market of \$106,153,161, of which new housing constitutes the major share of \$84,690,761.

Mr. Stangle stressed the value of the research Westinghouse has been carrying on to determine the possibilities of the market, and the best methods to approach and sell the equipment.

"We first built our plan, comprising several distinct phases, including a market analysis, and product development, a selling plan, an application method, and a service," he told distributors and dealers.

To obtain reliable facts and figures for our market analysis, we went to reliable sources, principal of which were government, educational research organizations, and the trade press, where a wealth of valuable data was available for our use.

"We first found that every house needs: 1. Controlled automatic heating; 2. Controlled automatic air circulation; 3. Controlled automatic air cleaning; 4. Controlled automatic air humidification.

"We found that every house will need: 1. Controlled automatic cooling; 2. Controlled automatic dehumidification.

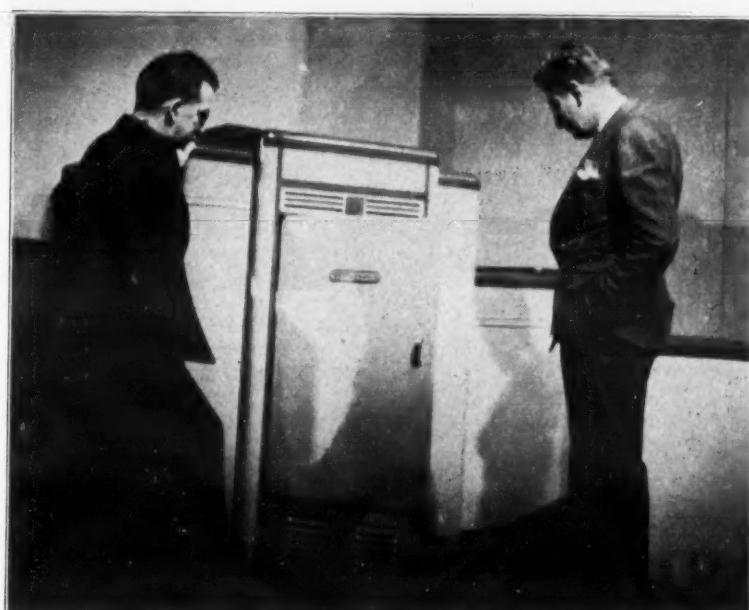
"We found that every new house now needs: 1. Careful planning for (Concluded on Page 14, Column 1)

Detroit ASRE to Hear Talk on Controls

DETROIT—A discussion of refrigerant controls by a representative of Minneapolis-Honeywell Regulator Co. will highlight the dinner meeting of the Detroit section of American Society of Refrigerating Engineers, to be held at 7 p.m. Thursday, Jan. 20, at the REFRIGERATION NEWS office.

F. O. Jordan, consulting engineer of the NEWS and manager of the consultation department of Refrigeration and Air Conditioning Institute, Chicago, will also speak.

They've Got a New Baby



J. G. "Gil" Baird, sales promotion manager, and H. F. "Duke" Hildreth of the air-conditioning department of Westinghouse Electric & Mfg. Co., look fondly on the Westinghouse residential air conditioner introduced last week to heads of distributing organizations in the central district.

Air-Conditioning Industry Converges on New York for Exposition & Conventions

NEW YORK CITY—Attention of the air-conditioning industry will be centered here next week as the Fifth International Heating and Ventilating Exposition, biennial display of latest developments in air conditioning, heating, and ventilating, opens for a one-week stand at Grand Central Palace.

That same week, members of the American Society of Heating and Ventilating Engineers, the American Society of Refrigerating Engineers, and the National Warm Air Heating and Air Conditioning Association will meet here for the annual conventions of their respective organizations.

The exposition will feature all types of equipment included in the following classifications: refrigerating equipment, air-conditioning and

ventilating apparatus, steam and hot water heating equipment, central heating equipment, combustion apparatus, controls and instruments, hydraulic apparatus, insulation, electrical equipment and specialties, metals and alloys.

Preliminary response to the exhibition indicates an increasing tendency upon the part of air-conditioning manufacturers to produce equipment capable of providing the consumer with year-around conditioning.

One manufacturer will show a humidifying and air-conditioning unit that keeps the air in constant circulation, thus keeping it from becoming stale or stuffy. This unit purifies the air by means of a fine, dense spray of pure water. It also supplies

(Continued on Page 13, Column 1)

York to Concentrate 1938 Sales Efforts on 'Package' Equipment

Trade-in 'Blue Book' Issued by Federal Refrigerator Corp.

NEW YORK CITY—A refrigeration trade-in appraisal "blue book," listing valuations on used refrigeration equipment, has been prepared by Federal Refrigerator Corp., wholesale remanufacturer of reconditioned refrigerators, reports John Bess, vice president and general manager.

The book contains data on trade-in refrigerators gathered during the past five years, during which period the company has purchased, remanufactured, and sold more than 25,000 used refrigerators, Mr. Bess asserts.

Market values for all makes of refrigerators, from the earliest types up to and including 1937 models, will be listed in the 1938 edition of the "blue book," Mr. Bess says. These values, he adds, have been established by the company through its purchases of almost all types of used refrigerators from dealers all over the United States.

Trade-in values listed in the "blue book" are "guaranteed" purchase (Continued on Page 2, Column 2)

Servel Plant Is Shut Down Until Jan. 31

EVANSVILLE, Ind.—Servel, Inc., on the night of Jan. 13 closed manufacturing division departments because of high inventory of finished products. All except a few divisions were affected and the action affected 3,500 of the plant's 5,000 workers. Operations are to resume Jan. 31.

"All departments of the manufacturing division except those which receive special notice will be closed from Thursday evening, Jan. 13, until Monday morning, Jan. 31," Louis (Continued on Page 2, Column 1)

Room Cooler Has Rotating Grille; Compact Design Marks Sectional Units

YORK, Pa.—Major sales efforts of the York Ice Machinery Corp. for 1938 will be placed behind a new portable room cooler embodying some novel features, and self-contained "package" conditioners for commercial applications, the company's distributing organization learned at the annual York conference and exposition held here last week.

Speaking before over three hundred representatives of branch and distributor organizations, Sales Promotion Manager J. L. Rosenmiller stated that while the company will continue to produce a full line of Freon compressors for air conditioning and standard commercial uses, the sales program for the coming year will feature portable and self-contained units ranging in capacity from 1 to 5 tons.

The York company also enters the residential heating and air-conditioning field for the first time, with a line of oil-burning boilers and residential air-conditioning systems of the "split" type, it was disclosed at the conferences, held under the direction of Sales Manager Stuart Lauer.

Styled by Walter Dorwin Teague, industrial designer, the new air conditioners have emphasis placed on lightness, style, and space con-

(Continued on Page 12, Column 1)

Dayton 'Sticker' Act Is Held Illegal

DAYTON—Dayton's plumbing "sticker" ordinance, which classified air conditioning as a plumbing fixture, has been declared unconstitutional by the court of appeals here. The decision will be taken to the Ohio State supreme court.

Original action began when the City of Dayton swore out a warrant against Ralph Bohachek, of Direct Plumbing Supply Co., for an alleged violation of the ordinance.

Defendant was found guilty in municipal court, and immediately he filed an appeal in the court of appeals, omitting the usual procedure of entering the common pleas court. The municipal court judge had main-

(Continued on Page 2, Column 5)

Well Water for Cooling Is Depleting Supply, Say Illinois Officials

SPRINGFIELD, Ill.—Rapid growth of air conditioning has led the Illinois State Department of Public Health to study means of conserving underground water supplies and ways of disposing of waste water from cooling systems without jeopardizing public health.

The department believes that the use of well-water for air-conditioning equipment soon would deplete the supply in a community, would strain the sewer system, overload the sewage plant, and involve the problem of cross-connections between the well and public water supplies.

"Geologists believe that the underground water supplies are already being seriously depleted in some communities in Illinois," the department states.

A suggested method of waste water disposal is sterilization and returning to the ground.

While no definite plan has been developed, sanitary engineers of the department and state geologists are cooperating on the problem.

York Distributors Gather to See 1938 Plans Revealed



(1) A. C. Evans (left) of York's sales promotion division, and Stuart E. Lauer (right), York vice president and general sales manager, prepare to greet old friends among the York distributing organization at the end of the first day's session. (2) Dan Brillhart of the Coreva Co., distributor in York, Pa., and C. C. Strauch, regional commercial supervisor for the Philadelphia territory. (3) At the registration desk the cameraman caught Frank Girard and Sam Diamond of the Broome Distributing Co., Binghamton, N. Y. (4) Pleased with 1938 prospects are N. H. Cartwright of York's Cleveland office, and Frank Marshall, central regional supervisor.

High Inventory Caused By Early Production Shuts Servel Factory

(Concluded from Page 1, Column 4)
Ruthenburg, Servel president, announced. "This action is made necessary because our inventory of finished products has reached the limit of our storage capacity, and incoming orders are less than the current rate of production."

It has been the policy of Servel to start full production as soon as the new models are brought out each year and build up stock in advance of the seasonal demand by dealers. Mr. Ruthenburg pointed out.

This year the new models were announced earlier than usual and the upper limit of inventory was reached before dealer's orders reached the anticipated volume.

Commenting upon the hearings which are being held in Evansville by the National Labor Relations Board as a result of the complaint filed by the C.I.O., Mr. Ruthenburg said:

"I wish that we could be spending the time and energy (required for these hearings) in selling goods."

"I will say, however," continued Mr. Ruthenburg, "that the examiner has been very fair and judicial in his attitude. We are thankful for that."

The N.L.R.B. hearings started Dec. 13 and lasted a week, then there was a recess of one week, and the session is now in its third week. Completion of the hearings is expected soon.

'Blue Book' on Used Units Seen as Aid To New Sales

(Concluded from Page 1, Column 4)
prices—that is, the company will pay the prices listed during the year for which the valuations are given. Mr. Bess says.

Decision to bring out the "blue book" followed requests for information from dealers, distributors, and department stores, the Federal Refrigerator Corp. executive added. The company expects that publication of the appraisal book not only will promote the sale of new refrigerators, but also will eliminate costly trade practices which force the dealer to sacrifice his profit on new refrigerators to offset trade-in losses, Mr. Bess declares.

Retail Trade Up 2 to 5% In Week Ending Jan. 15

NEW YORK CITY—Retail sales during the week ending Jan. 15 in leading centers of distribution gained an average of 2 to 5% over the preceding week, and 2 to 7% over the same week in 1937. Dun & Bradstreet reported in its weekly trade review.

Substantial inventory reductions in several retail lines were indicated, wholesale volume gaining 3 to 10% over a year ago.

Improvement in the eastern sections was irregular, with the average retail sales gain being from 2 to 7%.

Sales of Refrigerators in York, Pa. Continue at Good Pace During Winter Months as Dealers Stick to Outside Selling

Good Business Reported In December; Trade-ins Cause Little Trouble

Editor's Note: This, the second of a series of interviews by Air Conditioning & Refrigeration News staff members among electric refrigerator and appliance dealers in various parts of the country, reveals a comparatively happy state of affairs in the city of York, Pa.

The business recession hasn't borne too heavily upon the dealers, trade-ins apparently aren't a pressing problem, and despite the fact that a recent count of users has demonstrated that York is almost exactly on a par with the national saturation of 49.4%, the retailers are looking forward to a good sales year.

Fact that the survey indicates many of the dealers are active, wide-awake merchandisers, may be the reason for their happy state.

By Henry Knowlton, Jr.

YORK, Pa.—No serious recession in business was reported by refrigeration and appliance dealers interviewed here last week, although the percentage of saturation for refrigerators is 50% of the wired homes in the city, close to the national average of 49.4%.

Majority of dealers appeared optimistic over prospects for 1938,

1. Were dealers' unit sales volume in refrigerators during 1937 higher than that for 1936?

Eight dealers answered yes, two no, and five said no perceptible change. Average increase in sales was 16%.

2. What percentage of sales entailed replacements of mechanical refrigerators?

According to averages taken from the 15 reporting dealers, replacements amounted to 5% of total sales. This figure was increased materially by the high estimate given by one distributor doing a large tradeout business.

3. Did the introduction of new models help Christmas business?

All dealers reported that new models were not received in time for Christmas business and that 1937 models were being sold through the holiday season.

4. Were sales relatively better in December than in November?

Nine retailers reported yes, of which two said sales were up sharply, one reported no change, and four stated that sales started dropping about Nov. 8 and had continued down since.

5. What new items of equipment did refrigerator dealers take on during the year? Why?

Two took on electric ranges, two washers, one water heater, one gas ranges, one oil-burning space heaters. Reasons given: to broaden line, because of market demand, and in one case, to hold a major franchise.

6. Do dealers still carry on outside selling? Cold canvassing?

Thirteen reported yes, two no. Of those reporting yes, six use cold canvass methods with a number of outside salesmen.

7. What form of advertising or promotion did dealers find most effective during past year?

Ten voted for newspapers, two for user plans, one for direct mail, one for radio, and one for cooking schools. Of those voting for newspapers four recommended cooking schools, two user plans, and two radio, to supplement newspaper efforts.

8. Do dealers maintain their own service department? For all makes?

Thirteen dealers said yes, two used outside service organizations. All stated they handled service on own makes sold only.

9. Did dealers sell any kitchen ensembles or home-laundry combinations during 1937?

All dealers reported no, with the exception of the utility, which reported sales of four planned kitchens during the year.

although several reported that business declined gradually during the last two months of 1937.

According to Charles Chambers of the Edison Light and Power Co. there are 23,930 wired homes in York. A recent survey by the power company reveals that 11,974 household refrigerators are in use by York families.

Other major appliances in use include 23,859 radios, 18,821 washers, and 1,868 electric ranges.

Reports on refrigerator sales for 1937 compared with 1936 varied from a decrease of 25% by a small dealer, to an increase of 65% by a large retailing distributor. The average increase in sales for all dealers reporting was 16.3%.

Out of all appliance dealers in business at the beginning of 1937 only two ceased operations during the year. One of these was the refrigerator department of a department store, which was closed because of lack of volume, and the other was a dealer who suspended operations due to lack of adequate financing.

Up to the present time the "trade-in" problem is not serious in York. Many dealers reported that they accepted no trades, and the Anderson Hardware Co., Kelvinator dealer, stated that they had been successful in getting owners to dispose of their own old refrigerators. Mechanical boxes taken in trade by York dealers amounted to approximately 5% of the gross business, and these units do not present any retail problem at the present time.

New models were not available for Christmas, but practically all dealers reported a good holiday business. Several dealers reported a large number of cash sales and the Edison Co. stated that its December business was twice what it had been the previous year.

Asked about business during November and December, 1937, as compared with the previous year several dealers reported that sales were up sharply, and the majority experienced an increase in business.

John A. Spyker, assistant manager of the Careva Kelvinator Co., stated that while business dropped slightly in November, December was a normal month. H. H. Sprenkle, Stewart-Warner dealer, reported that business started slowing down about Nov. 8 and had continued on a downward trend since.

The majority of York appliance dealers went into 1938 with the same lines of equipment carried in previous years. P. C. Lichy, sales manager of Automatic Refrigeration Co., Frigidaire distributor, indicated that they had accepted additional

lines offered by Frigidaire, including electric stoves, washers, and water heaters. H. M. Rehmeyer, Apex distributor, reported a brisk consumer demand for gas ranges and oil burning space heaters.

Outside selling still predominates in York, with fully a third of the firms interviewed stating that a force of from 7 to 10 men was maintained. It was noted that firms employing "cold canvass" methods all experienced gains in business during 1937, while dealers dependent on floor traffic and "walk-in" customers reported a decline in sales. Weist's department store, which was entirely dependent on floor traffic for sales, closed out its refrigeration department.

Newspaper advertising was the favorite form of promotion used by dealers. Second in importance were cooking schools and demonstrations which proved very effective in securing business.

N. E. Goodling Electric Co., Norge distributor, and Freedman Bros., Norge dealer, both reported excellent results from a cooking demonstration that attracted 3,000 people early last year. Appliance were given as prizes and the success of the venture meant that it will be repeated this year.

Several dealers reported success from "using the user" plans, the Automatic Refrigeration Co. stating that fully 53% of their business was derived from frequent calls on owners of Frigidaire units.

The Runkle Furniture Co. reported a brisk business in Leonard refrigerators over a six month's period of the year, made possible by direct mail advertising. The entire refrigeration stock is purchased and sold during the spring and summer months, and no department is maintained during the winter.

Dayton Plumbing Law Ruled Out by Court

(Concluded from Page 1, Column 5)
tained that the ordinance was a health safeguard.

The ordinance provides that all plumbing equipment and supplies sold shall bear a sticker giving the name of the city inspector and a plumbing inspector. The seller also is required to file with the city plumbing inspection department the name and address of the purchaser in order that a final inspection can be made upon completion of installation work.

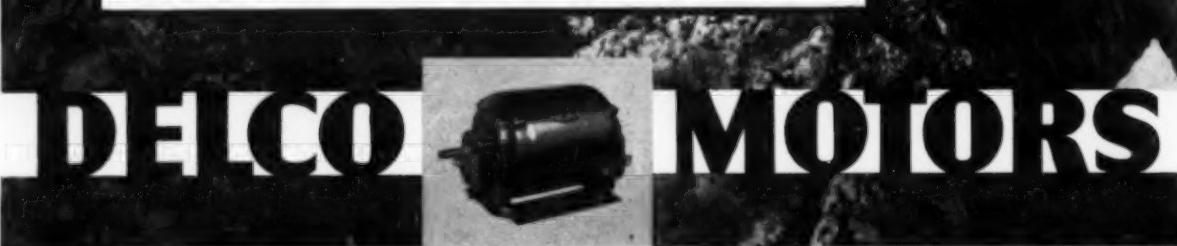


TO GET TO THE TOP BOTH MUST BE GOOD

1. THE REFRIGERATOR

Just as an expert mountain climber requires an expert partner, so a well-made appliance requires a well-made motor. Leading appliance manufacturers, realizing this fact, have selected Delco motors as a worthy teammate for their products. Smooth, silent and reliable, Delco motors provide a good selling point for dealers who handle Delco-powered refrigerators, washers, ironers, oil burners, stokers and air conditioners. Delco Products Division, General Motors Corporation, Dayton, Ohio.

2. THE MOTOR



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"GO TO TOWN" ON THE MAINLINE



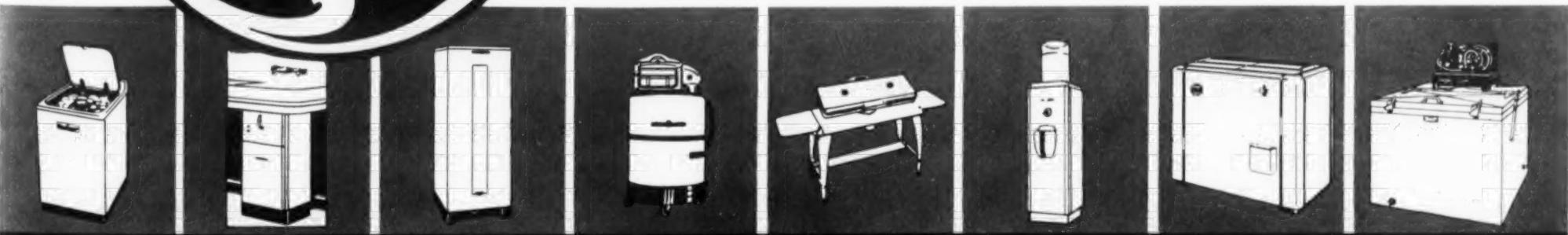
YOU'LL get to Profitown faster and more surely if you take the MAINLINE. No detours. No stopovers. And no extra fare! Get aboard and go places with General Electric in 1938—it's another G-E year!

In General Electric Appliances you have a complete line—headed by the popular Triple-Thrift Refrigerator that is the sales sensation of the year. Every G-E product has been proved by performance—and is identified by the famous G-E monogram familiar to practically

every wired home in America. It's a great name and a great line of products.

This year General Electric sales features are even more attractive, prices even more flexible, and promotion even more helpful than ever. See the new 1938 line of G-E Refrigerators, G-E Ranges, G-E Electric Sink (with Dishwasher and Disposall), G-E Washers, G-E Ironers, and the G-E "packaged" commercial refrigeration products. General Electric Company, Appliance Division, Nela Park, Cleveland, Ohio.

The COMPLETE line of electrical appliances for the home—every one proved by performance



GENERAL  **ELECTRIC**

Household Refrigerator Industry Displays Its New Wares at Chicago Shows



(1) Here's the new Barlow & Seelig "Speed Queen" refrigerator, as shown at the Furniture Mart show; and (2) This is the Briggs line, also shown at the Furniture Mart. (3) Universal Cooler's exhibit at the Stevens; and (4) General Electric ditto—with apologies from the cameraman for overexposure.



(1) Apex took almost the entire length of the south end of the Stevens exhibition hall. (2) Air Conditioning & Refrigeration News interests R. R. Ludington at Leonard's booth. (3) Jud Sayre (facing camera) talks to a couple of buyers about the Bendix home laundry. (4) At the end of the day the Kelvinator exhibit was well-thumbed. Those door hinges had a big work-out.



(1) John C. Bonning (left), merchandising director of the Potter Refrigerator Corp., is on the alert for more customers at the Potter booth. Two other refrigerators displayed at the show—Apex and Continental—utilize the Potter dual-evaporator principle. (2) At the Bendix booth a salesman goes through a complete demonstration. (3) Attendants at the Brunswick "Blue Flash" exhibit were kept continually busy. (4) Gibson had one of the neatest displays at the show, and drew an almost uninterrupted stream of visitors.

Plans for Dept. Store Meeting 'Big Secret'

NEW YORK CITY—Don't look now, but the National Retail Dry Goods Association is going to open its 27th annual convention at Hotel Pennsylvania on Jan. 31.

"A veil of secrecy will shroud the convention's opening," an N.R.D.G.A. press release declares, "as all plans are being kept under careful lock and key." Lew Hahn, general manager of the association, dropped a few hints on how "unique" and "novel" the meeting will be.

General Hugh S. Johnson, former N.R.A. chief and now a radio and

newspaper commentator, will climax the convention program when he addresses the association's banquet on the evening of Feb. 3.

General discussions will center around the three-fold problem of vendor relations, employee relations, and consumer relations. Credit managers and promotion men will have their own speakers and topics, and one entire session will be devoted to the problems of smaller stores.

Further light was shed on the convention's theme when Mr. Hahn declared that attention will be concentrated on the large, challenging issues of retailing in an attempt to formulate a program which retailers may use as a guide for their operations during the year.

Novel Demonstration Units



(1) Westinghouse has devised this skeleton display for easy and economical demonstration of its interior arrangement. (2) M. V. Stagg, Williams Ice-O-Matic distributor, was surprised by the optimism of buyers at the National Home Furnishings Show. (3) A white compressor and a representation of the Marathon Unit were features of the Williams Ice-O-Matic exhibit.

Pleasantaire Develops Movable Demonstration Conditioner for Dealers

WASHINGTON, D. C.—To help dealers in merchandising its 1938 room coolers, Pleasantaire Corp. is making available to them a folding roller stand, designed especially for the unit, which enables the salesman to demonstrate to prospects how the equipment will operate in their own homes or offices.

Believing that its 1938 sales will be in direct proportion to the actual number of hot weather demonstrations made in prospects' homes and offices, the company is encouraging the door-to-door selling plan, based on the following ratios: 50 interviews to average 10 prospects, and 10 prospect demonstrations to average one sale.

Use of the folding roller stand, the company believes, will make it easier for dealers and salesmen to obtain the greatest possible number of home demonstrations. The stand is furnished with each order for six Pleasantaire units.

After finding his 10 prospects, preferably in the same or nearby buildings, the salesman starts out with his sample room coolers in the back of his car, the folding stand beside him. At his destination, he unfolds the stand, gets one person's

help in placing the room cooler on it, and rolls the product right into the prospect's room, where he makes his demonstration.

In case the prospect wants a long demonstration, the unit is fitted into the window, so that heat absorbed can be sent outside; but in most cases, the company feels, this will not be necessary to convince the prospect of the benefits of installing a room cooler. Using this demonstration method, the company believes the salesman should be able to see at least 10 prospects daily.

The company has announced that it is awarding no dealer franchises, nor is it setting quotas for dealers, because, in its opinion, the industry is not ready for this type of selling. It is urging its dealers to spend money on direct-selling salesmen, rather than on advertising.

Don M. Chriss Joins Westinghouse Staff

MANSFIELD — Appointment of Don M. Chriss to the department store sales staff of Westinghouse Electric & Mfg. Co. has been announced by R. E. Imhoff, Westinghouse merchandising division sales manager. Mr. Chriss will devote his time to the promotion of the entire line of Westinghouse products for department store activity.

Mr. Chriss has had considerable experience in both the department store and electrical appliance fields. For the past two years he has been buyer for the electrical merchandise department of the Higbee Co., Cleveland, and previous to that was appliance manager of the M. O'Neill Co., Akron, Ohio.

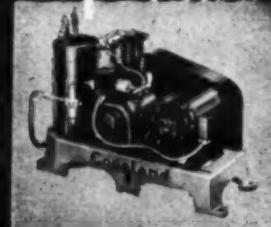
Porcelain
enamel on the exterior is such
a compelling talking-point and sales-
feature that it far more than justifies
the slight additional expense at-
tached to the "all-porcelain"
refrigerator.



PORCELAIN ENAMEL INSTITUTE, INC.
612 NORTH MICHIGAN AVENUE • CHICAGO

The Distributor Who Sells the Copeland REFRIGERATION LINE

IS BUILDING GOOD-WILL FOR YEARS TO COME!



It is just good business foresight to sell your customers a quality-built Copeland product. Whether you sell a Copeland Household Refrigerator, Commercial Refrigeration, Washer or Ironer, you are wisely building up a backlog of long-time customer satisfaction that will pay you dividends in continued patronage for many years.

Write for Sales Plan
COPELAND REFRIGERATION CORPORATION
Sidney, Ohio

Veteran Dealer Asks Industry To 'Take Time Out' & Consider Independent Retailer's Problem

DETROIT—Unless manufacturers and distributors of major electrical appliances take time out to consider the plight of the independent major appliance dealer, this dealer, although an essential link in the appliance merchandising chain, will eventually be destroyed, in the opinion of Colin Campbell, president of Campbell-Penfield, Inc., local appliance dealership.

Prime evils of the trade from the dealer's standpoint, according to Mr. Campbell, have been the extended instalment terms which have been forced upon dealers by manufacturers and finance companies, and the way in which distributors, with the tacit approval of manufacturers, allow larger discounts to apartment house operators and builders than they allow to dealers.

LUST FOR VOLUME

"Both of these conditions," Mr. Campbell explained, "have arisen as a result of the tremendous desire on the part of manufacturers and distributors to increase their volume even in excess of the logical capacity of their dealers. And it is this insatiable desire for increased volume which eventually, if not curbed, will bring about the downfall of the entire dealer structure."

"In the first place," he continued, "finance terms are still far too liberal, despite the fact that the

existence of his dealer organization in return for what little prestige he may obtain from the apartment house sale.

"It is my opinion that the overall dealer business is much more important to the distributor and manufacturer than the apartment house business. But both manufacturer and distributor maintain that the excessive apartment house discounts are made necessary by the pressure of competition, and no amount of appealing on the part of the dealer avails anything.

LEAGUE OF NATIONS?

"Perhaps we need a 'League of Nations' to smooth out the merchandising process and to protect the respective interests of manufac-

turers, distributors, and dealers.

"In all seriousness, however, I believe that the present situation does call for a showdown among manufacturers—a showdown in which all major manufacturers would agree upon certain standardized discount rates for builders and apartment house owners.

"It is time, I believe, that the manufacturers get together, put their cards on the table, and begin to play the game fairly. It is impossible for the dealer to heap vituperation on any one manufacturer, for all are guilty of the same misdeeds, and any solution of the problem must come in the form of concerted action on the part of all major manufacturers.

CAN'T HAVE SLACKERS

"It is an all-or-none proposition, for if any one manufacturer, or even a fairly large group of manufacturers, were to cease these malpractices while others continued them, the reformed group would be placing itself at a distinct disadvantage as regards competition.

"So much emphasis has been placed

on 'price' and 'discount' in the field of appliance merchandising that even the consumer has begun to think these matters are all a part of the game.

"Consequently, refrigerators and other appliances are no longer sold on a basis of merit, but rather on the basis of these two factors. In fact, the operations of the entire industry have begun to strongly resemble the ancient and dishonorable art of horse trading.

"But don't get me wrong," Mr. Campbell states. "Appliance dealers, as a whole, do not expect the distributors to grant them any special favors, privileges, discounts, or other concessions—they simply want an opportunity to carry on a clean and healthy business, a chance to make as much profit as their own initiative and ability will allow, without the necessity of combatting what they consider to be unfair competition from the manufacturers and distributors whom they serve.

THE QUESTION

"In other words, we simply ask for a square deal. And the solution

to the entire situation lies in the answer to this question:

Are the manufacturers and distributors going to face about and make a definite and sincere effort to build up the capable dealer organizations which handle their products, or are they going to continue to obstruct every opportunity which these dealers have of carrying on an intelligent and profitable business?"

One out of Four Leads from Employes Results in Sale

NEWARK—A total of 12,631 sales of electric and gas appliances resulted from 47,870 leads turned in during the first 11 months of 1937 by employees of the Public Service Electric and Gas Co. of New Jersey, according to company reports.

A breakdown of the sales made through employee leads follows:

Electrolux gas refrigerators, 781; house heating equipment, 556; irons, 252; Kelvinator refrigerators, 1,342; gas ranges, 1,937; vacuum cleaners, 1,076; washers, 1,671; gas water heaters, 1,543.

What Will The
DEALER
Think of It?

This Sign Is Prominent
on Our Walls Because..

- ... by putting "More for Your Money" in the product, with such convincing, easily demonstrated improvements as SAV-A-STEP and Slid-A-Tray
- ... by introducing Econ-O-Lite, the first visible proof of economy ever offered in refrigeration
- ... by developing an exclusive FREE Floor Plan and special retail finance plans to increase your sales and cut selling costs
- ... by more than doubling our advertising for the coming season
- ... by re-tooling completely for 1938 to give you the benefit of the year's only completely new refrigerator
- ... by providing the newest, most productive display material, merchandising aids and other sales helps

Stewart-Warner Corporation, Chicago, Ill.

STEWART-WARNER

SAV-A-STEP REFRIGERATOR

DEALER BIGGER BUYER

"It is extremely difficult for a dealer who sells in the neighborhood of 500 to 1,000 refrigerators annually to understand why he should pay a higher unit figure for these boxes than the apartment house owner who buys 30 boxes. The apartment house deal is a one-time sale for the distributor, while the dealer brings to the distributor a large volume of sales over a period of years.

"The result is simply this: the distributor is jeopardizing the very

Major Appliances

New Fast-Heating Ovens and Controls

Feature 1938 Westinghouse Ranges

MANSFIELD—New, sleeker styling and mechanical improvements, designed to make cooking faster, better, and more economical, are incorporated in the 1938 line of Westinghouse "kitchen-proved" electric ranges, now being shown by distributors and dealers.

The new line, consisting of 10 models, features a new "SuperOven," for which increased capacity and scientifically balanced heat distribution is claimed, and more efficient, faster, four-heat Corox "Economizer" surface units.

New Westinghouse range features, the company asserts, are the result of suggestions and comments made by "kitchen-proving" hostesses, 103 of whom tested the ranges in their own homes over a period of three months, preparing the same kind of meals they ordinarily serve.

By actually cooking on these ranges and familiarizing themselves thoroughly with electric cookery, these women were able to aid engineers in designing and constructing the new ranges to improve their use, convenience, and efficiency, the company claims.

Features of the new Westinghouse, in addition to the "SuperOven" and Corox "Economizer" units, include: easy-to-clean one-piece top and back splasher; easy-to-use marked switches and units; front operating clocks; easy-to-clean oven, with rounded corners and rounded shelf supports; automatic indirect lighting; compact oven utensil set; and large roller storage compartment and utensil file.

SINGLE-DIAL CONTROL

Every range in the new line is equipped with a single-dial oven control, so that at the turn of one switch the oven is turned on and the temperature set.

Other features found in the new Westinghouse line are: oven temperature control; oven signal lights; balanced, shelf-type self-locking door; completely removable oven equipment; deep well "Economy-Cooker" with adjustable trivet and deep fat fry basket; easy action switches; automatic appliance receptacles; adjustable platform lights that illuminate the entire platform surface; acid and chip resisting porcelain enamel finish; fully rounded corners; chrome plates,

ornamental trim; air-cooled handles; minute minder, a signaling device that marks a predetermined time for surface cooking; cigarette lighter, and an attractively illustrated recipe book.

In addition to separate warming compartments in some models, all ovens can be controlled in temperature as low as 175° making ideal warming compartments.

NO PRE-HEATING

Oven of the 1938 Westinghouse is said to have greater capacity than ever before, and, the company claims, is capable of baking biscuits evenly in 10 minutes with a cold oven start. No preheating is necessary for any baking or roasting operation. This speed is the result of two fast heaters that work together.

The new "heat-evener" is a porcelain-enamel covering for the lower heating element, so designed that the heat currents are directed evenly throughout the entire oven.

Every oven is insulated on all six sides with double thickness on top, where it is needed most. Because of this increased efficiency, 48 minutes out of every hour the oven uses no current for the average baking operation, the company claims.

NEW SURFACE UNIT

Another feature, the Corox "Economizer" surface cooking unit, has four heats, "high," "medium," "low," and "simmer." The 8-inch Corox unit has wattages of 2,000 for "high," 1,000 for "medium," 500 for "low," and 200 for "simmer." The "simmer" heat is said to use 60% less current than on ordinary units.

Flattened surface of the new Corox unit fits snugly against the bottom of utensils, giving increased speed and efficiency. The Westinghouse "Heat-Saver," a thermal brick on the Corox unit, makes it possible to cook for 50 minutes using no current at all, after it has first been turned to "high" for 10 minutes, the company asserts.

The 1938 Westinghouse line also offers an innovation in range construction, a new one-piece wrapper sheet body, enhancing the styling of the range, and eliminating all separations and divisions.

This unit body is more rigid, and therefore reduces the possibility of chipping, it is said.

The Emperor, most deluxe model in the Westinghouse line, comes standardly equipped with four Corox "Economizer" speed units, and two "SuperOvens," two large storage compartments, a utensil file, an aluminum oven set, an economy cooker, movable platform lights, two single-dial oven controls, identified switches and numbered surface units, oven lights, cigarette lighter, condiment set, and many other deluxe features.

The Regent is a reproduction of the Emperor, except it has a warming oven instead of a second oven. It has two four-heat Corox units and two standard three-heat Corox units.

SEVERAL SERIES

The Dictator, a range in the moderate priced field, is built to the floor and has the one-piece wrapper sheet construction. This model is equipped with one Corox speed unit, two standard Corox units, a deep well economy cooker, and condiment set.

The Conqueror is a low priced four-unit range on legs, employing unit body construction. It has one Corox speed unit, two standard Corox units, and the deep well cooker.

For apartment house needs and other small kitchen requirements, the Coronet is offered with three standard Corox units. It is equipped with the new oven and the single-dial control.

The 10-model line is completed with a four-unit promotional model, fully equipped. It has two oven heaters, and is available with either legs or base cabinet.

User Satisfaction Points To Range Sales Boost, Says Reese Mills

Barring further recessions in business, the electric range industry should sell at least 515,000 electric ranges in 1938, in the opinion of Reese Mills, electric range sales manager of Westinghouse Electric & Mfg. Co.

"In studying the future of the

For Faster and Cheaper Cooking



The young woman on the right draws her friend's attention to the flattened surface of the Corox "Economizer" unit on a 1938 Westinghouse range. This unit, of stainless steel, is said to give increased speed to electric surface cooking.

electric range, the only sensible thing to do is find out what the public thinks about it as a product," Mr. Mills said.

"Recently, we at Westinghouse did just that. Some 67% said that the electric range is "faster" than any previous methods, and some of them had previously used all kinds of fuel combustion stoves. About 24% said the results were the same. Only 9% said electric ranges were slower. All reported better cooking results through the removal of all the headaches, cooking gambles, hazards, and drudgery of the kitchen.

OPERATING COST VITAL

"Absolute cost of operation is also a vital point. Here again is what the users say: 60% say cooking cost is actually less by a substantial amount. An additional 32% say the saving exceeds the extra cost. Only 8% say it costs slightly more.

"This information was determined from a cross section of users, where accurate records were kept of all factors. Similar checks have been made in other ways, and the results are practically the same.

"With this public opinion in mind, let's turn to the records and see what has happened to the electric range business.

"It has required a 20-year promotional period for most conveniences to reach the first million users. After that, the growth is much more rapid. This has been the experience in selling automobiles, telephones, bath tubs, electric lights, electric irons, electric refrigerators, and many other products.

"The electric range was really put on the market for sale in 1914. It completed its 20-year period at the end of 1933. Records show the sale of about 1,170,000 ranges during that period—which is about an average performance. If it followed other similar equipment, the next million should be sold in approximately five years. 1934 to 1937 inclusive (a period of four years) will show the sale of approximately 1,250,000 additional electric ranges. Out of the total of 2,450,000 electric ranges sold, it is estimated that at least 2,200,000 are now in use.

RECORD OF GROWTH

"According to published figures, the growth of the electric range business since its 20-year promotional period has been phenomenal. Here are sales figures for the past five years:

1933	50,000 units	
1934	123,000 units	146% increase
1935	215,000 units	75% increase
1936	318,000 units	48% increase
1937	400,000 units	25% increase

"Of course, the electric range has not reached the point in its sales curve where its sales promotion can be dropped. To the contrary, it is now at a stage where a continuation of aggressive advertising, promotion, and selling efforts are essential on the part of all manufacturing, distributing, and retailing agencies."

'Water Action' Washer Introduced by Copes

CHICAGO—A new type of electric washing machine in which no moving part touches the clothes, and which does not have an agitator or a gear drive, was shown by Copes, Inc., Nappanee, Ind., at the home furnishings markets held recently in the Merchandise Mart here.

The new washer, first ever built by the 60-year-old Copes firm, is made under license of the Birdsell Water-Flex system, a development of the Birdsell Corp., South Bend, Ind.

Water action does all the work of washing the clothes, an impeller concealed in the center of the tub forcing water outward and upward, through and around the clothes.

Continuous circulation of water is maintained at high velocity, flexing the clothes. The water then returns to the bottom of the tub, carrying the dirt with it.

A major sales argument to be used by the Copes company is that their washer causes less wear and tear on clothes than ordinary types of machines. It is claimed that in tests the Copes washer removed from clothing only one-fifth of the amount of lint removed by conventional agitator washers.

Gear drive has been eliminated, and the motor is connected directly to the impeller through an automotive type clutch.

The washer can be completely disassembled in four minutes, it is said, and a complete load of clothes may be placed in the washer at the time of starting, with no picking up from a dead load.

The Copes washer will be presented in two models, both of the same size and with a 23-inch tub. The deluxe model, in white enamel, will retail at \$109.50. The standard model, in sun tan enamel, will retail at \$89.50. Both models are complete with motor-driven wringer and wringer apron.

Ruth Graham to Direct Electromaster Program

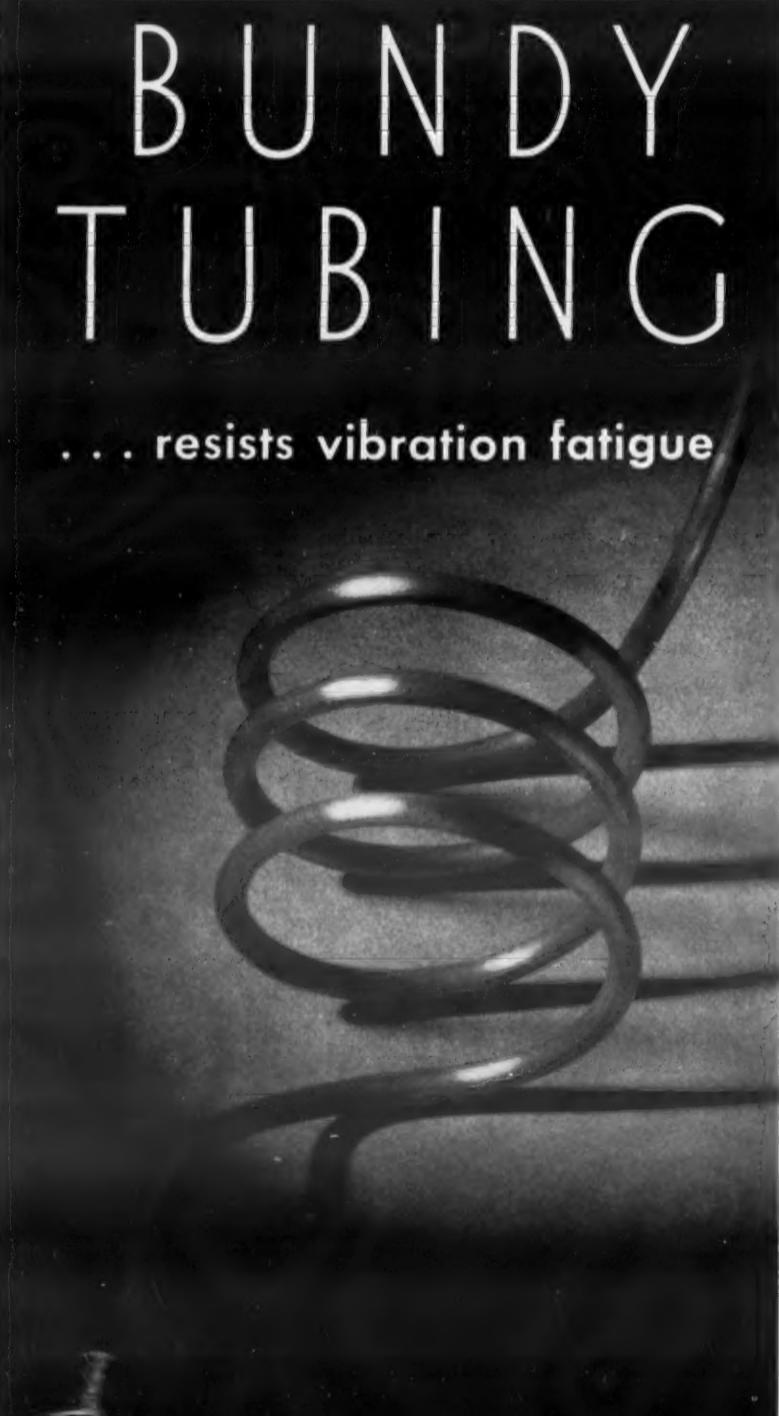
DETROIT—Miss Ruth Graham has been appointed director of home services for Electromaster, Inc., according to an announcement made by Walter C. Ayers, sales manager.

Miss Graham will direct educational work on Electromaster ranges, will have charge of the experimental and demonstration kitchen in the company's plant here, and will lecture and conduct demonstrations for salesmen and home service experts of utility companies and electrical appliance dealers and distributors.

A graduate of the home economics department of Michigan State college, Miss Graham attended the Merrill-Palmer school here and taught domestic science for four years at Birmingham, Mich.

BUNDY TUBING

...resists vibration fatigue



BUNDY TUBING CO.
DETROIT

Specialty Selling Ideas

Kitchen Cutlery Has Place in Range Story



This rather peculiarly arranged demonstration board has been designed to aid Kelvinator electric range salesmen to put over their story of the electric range's advantage in a graphic manner.

'Konvince Her' Board Is New Sales Help

DETROIT—To enable salesmen to explain the intangible advantages of electric range ownership, the advertising and sales promotion department of Kelvinator division, Nash-Kelvinator Corp., has developed the "Konvince-Her" demonstration board as the spearhead of its 1938 promotional aids for electric range dealers.

The Konvince-Her board was designed to provide a simple, visual means of demonstrating some advantages of electric cookery, such as coolness, cleanliness, and convenience, to the great mass of the consumer public, in line with Kelvinator's belief that the electric range has now reached the state where sales effort must be concentrated on the mass market rather than on the upper-income groups.

A solidly constructed, shoulder-high demonstration board, the Konvince-Her is finished in Prussian blue, banded with chromium, and has small semi-circular side shelves. Lettering is in red and silver. It is equipped with a chart and numerous household kitchen articles by means of which the salesmen can graphically illustrate his points to prospects in the showroom.

The Konvince-Her serves not only as a display for the customer, but also as a handy guide for the salesman in enumerating the features of the range.

Other electric range dealer aids offered by Kelvinator this year include sales training course literature, sound-slide films, a salesman's album, direct mail material, line folders, signs, banners, etc.

Stickers Seeking Service Prove Good Source Of Added Sales

OKLAHOMA CITY—"Assurance of getting quick, efficient service is one of the surest methods of inducing a prospect to deal with us," states Albert Ahrens, of Ahrens Co., local refrigerator and washer dealer.

"We keep this fact constantly before our patrons by enclosing with the monthly bills little stickers to be pasted on the back of their refrigerators," Mr. Ahrens says.

"These stickers give our name, address, and telephone number, with the suggestion 'For quick service telephone us.' And we see to it that prompt service is given."

Dealers Advised to Get Restricted Territories, Higher-Paid Salesmen

NEW YORK CITY—Restrict a dealer's territory, see that he employs only salesmen who are capable of earning at least \$200 a month, and then you most likely will have a retail merchant worthy of the name, C. Y. Belknap, executive vice president, Trade-Ways, Inc., told the Sales Executives club here recently.

Territorial limitation, Mr. Belknap explained, results in more concentrated cultivation of prospects. To illustrate his point he cited the case of two dealers, one of whom had a relatively large territory containing nearly twice as many prospects as the territory covered by the other dealer. During one year of operation, sales of Dealer No. 1 averaged 50 cents per prospect, while the per capita volume of Dealer No. 2 was \$1.40.

200-PER-MONTH MEN

On the matter of salesmen and salesmen's earnings, Mr. Belknap voiced the opinion that probably no retail salesman was worth keeping on the payroll unless he could make at least \$200 per month. He further revealed that the results of his studies indicated that a retail salesman's volume tends to increase in direct proportion to his experience.

Again backing up his contention with a specific instance, Mr. Belknap told of one salesman who did only \$400 worth of business his first month, but whose sales increased steadily until in his 24th month his volume was \$1,300. Salesmen who do not show consistent improvement should be dropped by the end of the sixth month, he declared. Frequently even four months is ample time in which to discern the new man's ability—or lack of it.

DEALERS' IDEAS SURPRISE

These facts about salesmen usually will hold true regardless of the ability of the dealer, although naturally first-class dealers give their salesmen far more skillful direction. The better class of retailer also is more careful about the selection of his salesmen, Mr. Belknap observed.

That manufacturers often can profit by a study of retail methods is another one of Mr. Belknap's contentions. Not infrequently, he said, retailers, especially of the higher type, will hit upon some scheme of merchandising or display which could be profitably adopted by the manufacturer.

Mr. Belleranti's Shelter for Commuters Pays Off in Appliance Sales

CUDAHY, Wis.—Averaging 12 extra sales a week from commuters using the waiting room he put in his store, Samuel Belleranti, owner of the Economy Electric Shop here, has found that it pays—in hard cash—to be courteous.

For the convenience of Cudahy citizens traveling daily on the interurban electric trains to their work in Milwaukee, Mr. Belleranti set aside the front section of his store as a waiting room.

WAITING ROOM LITERATURE

And for the benefit of his own business, Mr. Belleranti arranges attractive displays of the appliances he sells, places pamphlets, booklets, and leaflets concerning these appliances within easy reach, sees to it that someone is always on hand to answer questions about the products, and then lets human nature take its course.

While waiting for the trains to come along, the commuters pass the time reading the literature and inspecting the refrigerators, electric ranges, washers, and various smaller appliances in the store.

CLOSING MADE EASY

In many cases, Mr. Belleranti says, casual interest develops into a strong desire to buy, and closing the sale becomes a comparatively simple matter. Mr. Belleranti estimates his daily prospect total averages 10.

"Most of these prospects," he states, "inspect the appliances on display and ask us questions about them. We can hardly approach a stranger in regard to buying something, for that would scare him away permanently."

IT BUILDS UP

"In the case of a mildly interested prospect, he may see a refrigerator each day he comes into the waiting room, until the idea of buying it makes such a strong appeal that he does buy."

"Often we obtain the names of prospects in our waiting room, but cannot try to sell there. In such cases, I make calls in the late afternoon and evening at the prospects' homes. Through such follow-ups we are able to close many sales."

200 TO WORK ON

Mr. Belleranti's current list of prospects obtained through the waiting room contains about 200 names.

The Economy Electric Shop handles Grunow, Leonard, and Westinghouse refrigerators; Estate and Westinghouse ranges; Kelvinator and Thor washers; Fairbanks-Morse stokers; and Estate oil heaters.

The floor display includes eight refrigerators, four washers, four ranges, one stoker, and one oil burner.

Various smaller appliances also sold by Mr. Belleranti are displayed in wall cases.

Special Terms & Bonus Help Puerto Rico Drive

SAN JUAN, Puerto Rico—Almost 300 Westinghouse refrigerators were sold in a 60-day campaign recently conducted here by the Puerto Rico Railway Light and Power Co., according to a report from William L. Zwigard, commercial superintendent in district No. 2 for Westinghouse Electric International Co.

Quota for the campaign was 150 units, but this total was reached in 28 days, Mr. Zwigard said.

"By the last day we had sold 286 refrigerators," he continued. "Our only excuse for not reaching the 300 mark was that we were sold out."

"Each of the refrigerators was sold separately; that is, none was sold in quantity for apartment buildings. The average selling price per unit was over \$200."

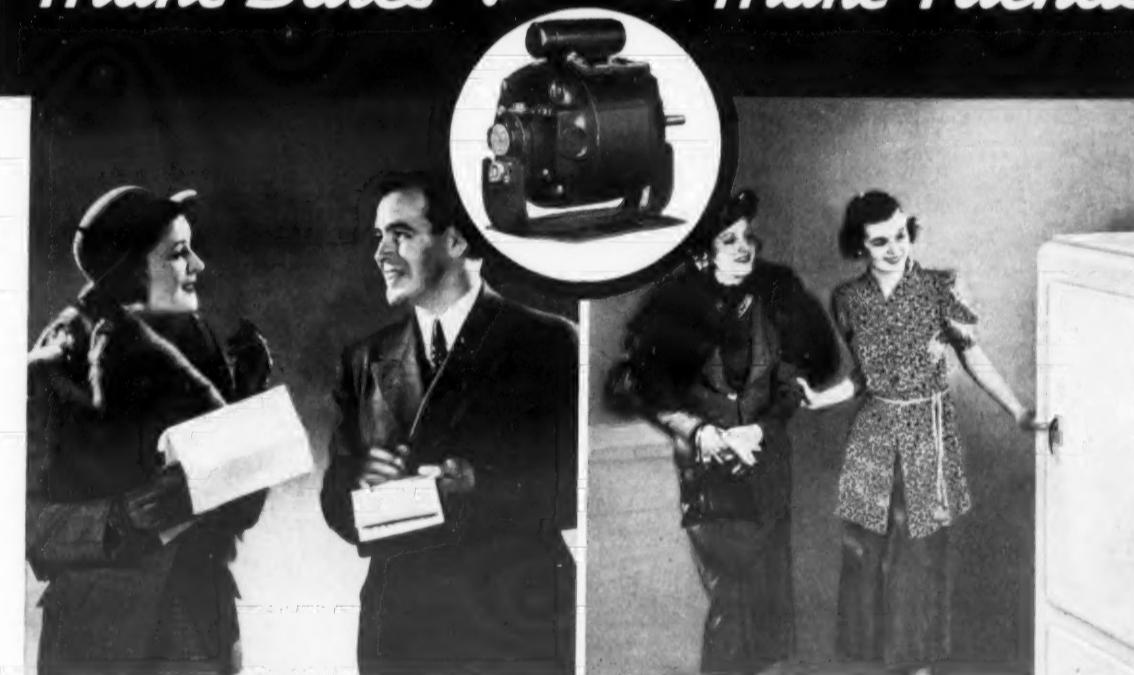
"Terms were extended six months longer than usual. Most of the sales made during this drive were on the deferred payment plan, with the minimum down payment \$10 and the maximum time in which to complete the contract 30 months."

In explaining the utility's set-up in conducting the campaign, Mr. Zwigard said that a total of 48 men did the selling. The entire system was divided into seven key districts, or agencies, each having a quota of its own.

"A commission of \$5 was paid for each refrigerator sold," Mr. Zwigard said. "However, in the event that the agency reached its quota, the commission automatically became \$10. Every agency exceeded its quota."

LET G-E MOTORS HELP YOU

Make Sales and then Make Friends



G-E MOTORS aren't going to grab prospects off the street and make them buy your refrigerators, but they will help you close the sale. Suppose that a woman comes into your store to buy a refrigerator. She likes the appearance and the interior arrangement of your machine. Then she comes to the G-E motor.

She has heard from friends about the high quality of G-E electric equipment, or perhaps one of her dependable home appliances is equipped with a G-E motor. General Electric has been making motors for many years—millions are in service today. Anyhow, the G-E monogram is visible evidence of reliable electric equipment. Add this to the other good features of your refrigerators, and it won't be long until you are asking the address and when delivery is desired.

WE believe that a prosperous appliance business is based on satisfied customers—they return to buy other appliances, and they say things that make their friends your friends. This is how G-E motors, with their many years of trouble-free service, help to sell you and your refrigerators.

By constant research, General Electric has been building increasingly improved motors to match the improvements in electric refrigerators. For example, the cast-aluminum rotor is indestructible, oiling is required but once a year, and the automatic belt-tightener base gives long belt and bearing life. Every G-E motor is carefully checked and given a complete running test. You can be sure that they will do their part to keep your refrigerators operating satisfactorily. General Electric, Schenectady, N. Y.

GENERAL ELECTRIC

Filing No. 8260

970-221

Commercial Refrigeration

Dealer Builds Reach-In Box Holding -25° F. For Use in Testing Highway Concrete

LEXINGTON, Ky.—Building a reach-in refrigerator that operates at -25° F. is all in the day's work for Ralph Smith, manager of the Kelvinator department of the Combs Lumber Co. here.

At the State Highway Department at Frankfort, Ky., a laboratory is maintained for testing concrete, using different kinds of native rock and sand as a base. Purpose of this research is to apply native materials to an extensive road building program which includes several large concrete bridges. Concrete mixtures are tested for the usage they would get on a highway or in a heavy bridge.

"During recent years," said Mr. Smith, "the only test Kentucky highway engineers were unable to make was a low temperature test. To get a thorough analysis of concrete under all weather conditions test blocks must be exposed to sub-zero temperatures for many hours. For this purpose we designed a

refrigerator of the following specifications:

5 feet 2 inches wide x 3 feet 2 inches deep x 4 feet 8 inches high—having 7-inch walls, being two layers of 3-inch corkboard and one inch of wood on the exterior, with a galvanized iron lining, soldered, watertight.

The front was arranged with two doors, leaving a closed space at the top for the coils. Three shelves were installed, 8 inches apart, to accommodate round concrete blocks, 4 inches in diameter and 6 inches high, and were constructed of heavy galvanized bar iron.

A 1/2-hp. water-cooled low-temperature Kelvinator condensing unit and two LC-23-42 low-temperature Kelvinator coils were installed.

"We maintained a -25° F. temperature last summer when the surrounding air temperature was 95° F., and the condensing water temperature was 82° F. during a 14-hour operation," Mr. Smith concluded.

Sabroe & Co. Building Units for Ocean Liners

COPENHAGEN, Denmark—Refrigerating equipment for two large ships being built for the Blue Star line by Burmeister & Wain will be supplied by Thomas Ths. Sabroe & Co., Aarhus, largest commercial refrigeration company in Denmark, according to a report from the office of the American commercial attaché here.

The order includes refrigerating plants for fruit and frozen meat cold storage rooms and smaller units for the pantries and bars of the Blue Star liners.

Sabroe also is supplying the cold storage and air-conditioning plants for two vessels being built for the Polish-American line by Nakskov Shipyard, Nakskov, Denmark, and Swan, Hunter, & Wigham Richardson, Newcastle, England, shipbuilders.

2 Air Conditioners Used In Dairy Storage Room

BALTIMORE—Equipped with two air-conditioning units, the cold storage room of the new model dairy plant of Green Spring Dairy, Inc. here is insulated with six inches of cork on the floor and four inches on walls and ceilings.

The air conditioners are installed at opposite ends of the room, being connected by a metal duct.

Three evaporative condensers are housed in the central tower of the dairy plant, and four other compressors are in the basement machine shop.

Of the latter, two are enclosed, semi-automatic ammonia units, each of 50 tons capacity and driven by a 60-hp. electric motor; one is a 20-ton compressor of the same style, and the fourth is a 5-ton unit.

Milk is cooled by direct expansion of ammonia, and is kept cool in storage tanks equipped with close-wrapped coils using refrigerated sweet water.

Bakery Finds Profit in 'Refrigerated Specials'

BERKELEY, Calif.—By posting daily lists of 10 refrigerated food "specials" in the front windows and inside the store, the Doe Shop, local bakery, has built up a regular clientele which now accounts for half of its business.

Dempsey, Crane & Cook Are Promoted by Liquid Carbonic

CHICAGO—Three changes have recently been made in the executive personnel of Liquid Carbonic Corp.

C. W. Dempsey has been elected by the corporation's board of directors to fill the post of vice president, in addition to his present position as secretary; Roy H. Crane has been promoted to the position of sales manager of the soda fountain division; H. L. Cook has been named assistant general sales manager of the corporation.

Mr. Dempsey joined Liquid Carbonic Corp. in 1921 as an assistant cost man in the comptroller's department. Later he was named comptroller and then secretary.

In 1926 Mr. Crane started selling soda fountains for the corporation's Dallas branch and was so successful that he soon was transferred to the home office in Chicago to take charge of sales promotion. Later he was made advertising and sales promotion manager, and in 1936 was appointed assistant general sales manager.

Mr. Cook joined the organization as a salesman for its Kansas City branch. He later was made manager of the Philadelphia branch, and then was appointed eastern district sales manager with headquarters in New York City.

8 New Trucks Transport Birdseye Frosted Foods

BOSTON—Eight new refrigerator trucks, all equipped with Dry-Zero insulation to handle Birdseye frosted foods, have been added to the J. Coyle fleet operating out of Boston to New York City and Bridgeton, N. J.

Each body carries 10 tons of frosted foods at a temperature of 15° F. Refrigeration is supplied by solid CO₂. Bodies are insulated with Dry-Zero Blanket in the roofs, sides, and ends, and with cork in the floors.

Bourbon Sales Co. to Push Kelvinator Commercial

BALTIMORE—Bourbon Sales Agency, operated by A. J. Bourbon, is now concentrating its efforts on sales of Kelvinator commercial refrigeration equipment and other Kelvinator products. A crew of outside salesmen is employed by the agency.

Sterling Refrigeration Is Fogel Distributor

BALTIMORE—Sterling Refrigeration Co. has been appointed exclusive local distributor for Fogel Refrigerator Co., Philadelphia, handling the latter's commercial refrigeration equipment. I. W. Sterling and R. F. Parr head the distributorship.

Frick Low Temperature Equipment Is Used In Shrimp and Strawberry Freezing Plants

WAYNESBORO, Pa.—Two commercial refrigerating systems using Frick equipment have recently been installed in low temperature food processing plants, the first in a shrimp-freezing plant in Port Lavaca, Tex., and the other in a strawberry-freezing plant in Ponchatoula, La.

The shrimp plant, municipally owned, is the result of a complicated triple-contract engaged in by a dredging and wharfing company, a building contractor, the Southern Engine and Pump Co., Frick distributor in Houston which handled all machinery and electrical work, and the Garrett Engineering Co., also of Houston, which took care of general engineering.

Shrimp are frozen in two rooms, each 30 by 15 by 11, insulated with eight-inch corkboard and equipped with 6,800 linear feet of 1 1/4-inch ammonia coils. The latter are connected to an 11 1/2 by 8 Frick booster compressor. Temperature in the freezing rooms is maintained at -20° F.

FREEZER ROOM TEMPERATURE

Freezer rooms are connected by an anteroom to a storage room, 30 by 45 by 11, which is kept at a temperature of 5° F. by 4,000 feet of 1 1/4-inch coils.

Another feature of the plant is a 30-ton ice making tank, behind which is an ice storage room of the same dimensions as the shrimp storage room, but with only 3,000 feet of coils.

All coils operate on the flooded system, and the room coils are arranged in bunkers so that they can be operated singly or all together for partial or full loads.

Compressors other than that connected to the two freezer rooms include a 10 by 10 and 8 by 8. Power is supplied by two Atlas Imperial engines, burning natural gas, each of which has six cylinders and develops 155 hp. One of these engines drives the 10 by 10 compressor and a 50-kw., 2,300-volt General Electric generator with direct connected exciter.

EXTRA POWER FURNISHED

The other engine drives the 8 by 8 compressor and a 75-kw. generator. The booster compressor in the shrimp freezing rooms is driven from an electric motor deriving current from either of the generators operated by the Atlas engines.

This power equipment not only furnishes all the power requirements for the freezing plant itself, but also supplies power for the city of Port Lavaca to pump all of its water.

The strawberry packing plant in Ponchatoula is a brick building 150 feet wide, 250 feet long, and 24 feet high, with one side lining a railroad. Freezing room, of which floor, walls, and ceiling are insulated with 6-inch corkboard, is partitioned into four sections each 50 feet long, 35 feet wide, and 15 feet high, and has an anteroom 10 feet wide right through

the center.

Over this anteroom are two bunkers equipped with Frick vertiflow coils, accumulators, and float control valves. Air is circulated over the coils by fans, and is then supplied to the freezing compartments by ducts so arranged that all or any part of the air can be directed into one room.

AIR CHANGE SPEEDED

Change of air in any room can be made in half a minute. When freezing at the rate of 100 barrels a day, each barrel containing 450 lbs. of fruit, the freezing room temperature can be held at 20° below zero F.

The freezing system operates on a Frick 11 1/2 by 8 two-cylinder enclosed type ammonia booster compressor, V-belt driven by a 30-hp. motor. Capacity of the booster at 400 r.p.m. with minus 35° suction is 38.4 tons of refrigeration.

The booster is connected to a water-cooled intercooler and a discharge-and-liquid cooler. Discharge from the booster is taken by a 9 by 9 Frick ammonia compressor, operating at 300 r.p.m. and V-belt driven by a 75-hp. motor.

EQUIPMENT USED

The freezing plant, which is operated by Marion T. Fannaly, Inc., also contains two 30-ton Frick ice making tanks, each housing 374 all-welded ice cans and equipped with vertiflow coils, float controls, accumulators, vertical agitators, electric hoist, and low pressure raw-water equipment.

There also are two 9 by 9 Frick ammonia compressors operating at 300 r.p.m. and V-belt driven by electric motors. They have horizontal multipass shell-and-tube condensers, consisting of five shells, each 16 inches in diameter and 15 feet long, with 48 1 1/4-inch tubes, a Frick gas purger, and the necessary receiver.

100 BBL. DAILY CAPACITY

When the plant is in full operation, with a daily output of 100 bbl. of frozen berries and 60 tons of ice, all compressors are in use.

After the berries are frozen, the booster compressor is shut off and a dual-effect compressor, one of the 9 by 9 machines, holds the temperature in the freezers constant.

The other compressors are operated as required for ice making.

As the frozen strawberries are sold, the vacancies left in the freezing room are filled with blocks of ice, thus increasing ice storage capacity. This extra ice is valuable, for blocks used in icing cars for fresh berry shipments to the plant are practically all consumed by the time the freezers are needed.

Philadelphia ASRE Inspects Banana Boat's System

PHILADELPHIA—An inspection of the refrigeration system in one of the banana boats of Fruit Dispatch Co. featured the meeting recently of the Philadelphia section of the American Society of Refrigerating Engineers at Pier 9, North Wharves, here.

Following the inspection of the vessel, the members of the section dined at Bookbinder's restaurant.

February meeting of the section will be held jointly with the local chapter of the American Society of Heating and Ventilating Engineers at the Engineer's Club.

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Air Conditioning News

Governair Making New Room Cooler

OKLAHOMA CITY — Production of the new "Governair" room cooling unit was begun here last week by Governair Corp. after a long period of experimentation and development.

Designed to meet requirements of the usually warm summers of the South, the Governair cools, dehumidifies, ventilates, circulates, and filters the air.

No plumbing connections are necessary. When the unit is placed before a standard-size window, a conduit to the outside may easily be adjusted.

The Governair is mounted on ball-bearing, rubber rollers for easy transportation from one room to another. All component parts are standard, all moving parts are rubber-insulated from the welded steel frame, and acoustical insulation is used throughout. Cabinet is of beautifully finished walnut.

Radio Promotion Used By Kansas City Council

KANSAS CITY, Mo.—To keep air conditioning in the public mind throughout the winter, the Air Conditioning Council of Kansas City is sponsoring a daily radio spot announcement, featuring furnace fans. Announcement varies in time each day, starting at 7 a.m. and progressing daily to 4:45 p.m., the idea being to catch all classes of listeners. Results began to show within 15 days of the start of the broadcast series, Council headquarters reports.

Evansville Electric Installs 15th Theater Job

EVANSVILLE, Ind. — Evansville Electric Service, Inc., Westinghouse distributor, made its fifteenth theater air-conditioning installation in this territory in the new Carlton theater here.

LOOK AT THE PLUS+ VALUE OF Artic (DU PONT METHYL CHLORIDE)

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- 7 Has low head pressure, adaptable to air-cooled condensers and light-weight equipment.
- 8 Economical of power.
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- 10 Easy to "hold"—comparatively low leakage.
- 11 Easy to engineer—no unusual design problems.



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The R. H. Chemicals Dept., Wilmington, Del.

Air Conditioning Found Taking Place with Other Matters of Management

NEW YORK CITY—The best current market for air conditioning by a wide margin is in the commercial field, according to Roderick P. Stewart, business editor of Barron's, weekly financial newspaper. A survey reported by him shows that in 31 large cities the horsepower of installations for this year will be divided about 71% commercial, 12% governmental, 9% industrial and 8% residential.

Horsepower of industrial air-conditioning installations in these cities is expected this year to exceed 1936 figures by 76%, with residential installations up 67% and commercial up 60%. Governmental installations slightly exceed industrial and residential in terms of horsepower this year, and show a huge percentage increase over 1936.

In some lines at least, the question "What is this concern's policy toward air conditioning?" bids fair to take its place among bankers' and investors' queries along with such subjects as management, extent of research activities, working capital, and earnings record, according to Mr. Stewart.

Printing, publishing and foods led among the industries reported as planning to do most air conditioning this year, with chemicals and drugs next, followed by textiles, machinery, automobiles, railroads, leather, metals, mining, stone, clay and glass, petroleum, and rubber, in the order named.

Department stores, restaurants and cafes, office buildings, private offices, women's specialty shops, bars, grills and night clubs, hotels, men's clothing stores, beauty shops, shoe stores, public buildings, drug, chain, candy and jewelry stores, fur shops, undertakers, food stores, and florists are declared to be the most important commercial fields for air conditioning.

Installed cost of equipment sold by members of the Air Conditioning Manufacturers' Association is expected to total about \$85,000,000 in 1937.

Competitive conditions have hastened acceptance of air conditioning by department stores.

Because of direct returns traceable to air conditioning, restaurants and cafes are a responsive classification.

Air conditioning activity among office buildings is spotty, depending on competitive conditions.

Prospects for installations in private offices are far from being confined to office buildings, but also are found in commercial structures, factories, institutions and the like.

Central plants are favored to serve groups of offices while units to serve single offices or suites have been rapidly taking hold.

Acceptance of air conditioning by women's specialty shops is good, and competition has made it a necessity in many cities.

Hotels, men's clothing and furnishing stores and beauty shops are pointed out by Mr. Stewart as fields where air conditioning is important and is being installed in steadily increasing volume.

Among chain stores, he says, air conditioning has met with better than average acceptance, following the chain practice of making installations in a limited number of stores and studying their value.

Shoe stores which installed air conditioning reported it reduced the summer slump in 1937, and aided in fitting and satisfying customers.

Norge Air-Conditioning Dealers Named in Ohio

CLEVELAND — Appointment of two new Norge air-conditioning and heating dealers here has been announced by C. H. Wilson, manager of the Norge division of Strong, Carlisle & Hammond Co., distributor. The new dealerships are: the A Home Heating Co., Cleveland, headed by Don Fisher, and William E. Donnelly Co., Lakewood, Ohio, managed by William Donnelly.

Tests in Home Equipped by Buffalo Council Prove Benefits to Hay Fever Sufferers

BUFFALO—The efficacy of the air-conditioned home as a means of combating hay fever was disclosed in a report made recently before the Medical Society of Erie County by Dr. Nelson W. Strohm, member of that society.

Dr. Strohm, associate member of the Air Conditioning Council of Western New York, conducted an extensive hay fever study in a model electric home here under auspices of the council.

His findings disclosed that sufferers of hay fever felt relieved usually within half an hour after entering the air-conditioned home.

The actual study included 19 days of treatment rendered patients. More than a score took advantage of the opportunity for relief afforded.

Dr. Strohm reported they spent a total of 66 patient days in the model home, which represented a total of 347 hours. The hours varied greatly with the patients, being from 2 to 120.

There were six patients who spent 16 or more hours taking the treatment, and 14 who spent less than eight hours.

Summarizing the study, Dr. Strohm announced the effect every patient received, whether he spent two or 120 hours, was a sense of relief in about half an hour after entering the air-conditioned room. Also the benefits experienced after leaving the home in almost all cases was continued from 3 to 24 hours.

A number of specific cases were outlined in Dr. Strohm's report. Among them:

Patient F. F., age 49, physician diagnosis perennial asthma and chronic bronchitis, has a positive skin reaction to house dust, dog epithelium, pyrethrum, rice, ragweed and oak pollens and feathers and oats.

She received marked relief within half an hour after entering the unit, and the relief persisted from 12 to 15 hours after leaving. This patient had been suffering for 18 years.

The prize patient for sincerity was S. Dk., age 13, boy, who has been suffering from hay fever for five years. He spent 120 hours in the unit. His physician reported that the patient was definitely benefited by his visits.

The patient himself feels that he has been greatly benefited. Within half an hour after entering the home he was practically free from all symptoms. At first his relief lasted three hours, but it gradually increased until it continued for 24 and more hours.

Reports on other patients practically parallel those outlined above.

As a result of the study, dealers and contractors handling air-conditioning units for homes here are renewing their efforts to increase unit sales and are using the case study as one of their strongest sales weapons.

Airtemp Claims 204% Gain In '37 Cooling Sales

NEW YORK CITY—Sales increase of Airtemp air-conditioning equipment during 1937 was two and a half to three times as great as the increase made by the industry as a whole, claim officials of Airtemp, Inc., subsidiary of Chrysler Corp.

"Airtemp factory sales for the year 1937 are 204% greater than last year on cooling equipment and 45% greater on heating equipment," stated A. C. Downey, Airtemp president. "Latest figures released by the U. S. Department of Commerce indicate that sales of the air-conditioning industry gained 83% on cooling equipment and approximately 15% on heating equipment this year over last."

Mr. Downey made the claim for his company that one of the chief factors responsible for Airtemp's reported sales increase was the tooling up of the Dayton factory for modern, straight-line production methods similar to those used in the Chrysler automobile plants.

Argentine Navy Building To Have Air Conditioning

BUENOS AIRES, Argentina—Second basement of the new 15-story building planned for the Argentine navy department will be used entirely for the installation of air-conditioning equipment, heating apparatus, electric washing machines, and electrical transformers, according to a report from the office of the American commercial attache of the American Consulate here.

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Good Prospects Seen For 'Package' Units

MIX one part of the current business recession with one part of the expanding market for air-conditioning equipment, stir in a liberal sprinkling of special observations based on private investigations, then shake well—and you may be able to paint a picture of the air-conditioning market for 1938 in the colors envisaged by "big names" in the air-conditioning industry.

If you want something a little more definite, you might refer to the statement made by President George Mason of Nash-Kelvinator Corp. in last week's issue of the NEWS to the effect that "Retail air-conditioning sales in 1937 amounted to slightly more than \$100,000,000. While present business conditions make any accurate prediction difficult, it is the general consensus that the total for 1938 will be higher, something between \$100,000,000 and \$150,000,000."

E. B. Freeman, president of B. F. Sturtevant Co., predicts that the 1938 dollar volume will reach \$250,000,000. Most other major air-conditioning executives agree that sales for 1938, despite the threat of a continued business slump, should equal or exceed sales for 1937.

Almost unanimously, air-conditioning manufacturers agree that the trend for 1938 will be toward "packaged" units, with the self-contained, semi-commercial, "store" type of conditioner leading the way.

Of this "store" type of unit, P. Y. Danley, manager of the refrigeration and air-conditioning department of Westinghouse Electric & Mfg. Co., says, "I expect that this type of unit will show the largest increase in percentage in the near future, although undoubtedly the installation of complete systems will continue to lead in total dollar volume."

President Reuben N. Trane of The Trane Co. warns, however, that this vogue for "packaged" units is only temporary. "The actual trend," he declares, "is toward complete air conditioning, and I see a much greater percentage increase in this type of system."

Further testimony in behalf of the market for complete systems was offered by the Sturtevant Co.'s Mr. Freeman, who stated that his firm had noticed "no perceptible trend toward 'packaged' units," and who strengthened his comment with the remark that "We expect to see the greatest increase in complete air-conditioning systems of the carefully engineered type."

Two types of outlets will handle the major portion of the air-conditioning business for the coming year, according to executive prognostications: the refrigeration or specialty appliance dealer to sell the "packaged" units, and specialized air-conditioning contractors to install complete systems.

While Mr. Trane expresses his belief that "ultimately all air conditioning will be sold by air-conditioning contractors," President A. W. Conley of Corozone Air Conditioning Corp. declares that "There unquestionably is a large future for the refrigeration distributor or dealer as well as any specialty appliance selling organization" in the air-conditioning field. In this opinion, Ray G. Hilger, president of XL Refrigerating Co., Inc., concurs.

Mr. Mason also supports Mr. Conley's opinion with the theory that "1938 will be essentially a small-unit year," and that "specialty merchandising technique is definitely necessary in the sale of this type of equipment."

That adequate education for air-conditioning distributors and dealers is still one of the biggest needs of the industry is evidenced by the following statement by J. J. Donovan, manager of the air-conditioning department of General Electric Co.:

"Shortly after the first of the year we expect to open a new building to be called the General Electric Air-Conditioning Institute, the sole function of which will be to provide facilities for the training of distributors, dealers, and their sales and engineering personnel."

Pointing out the desirability of making the air-conditioning business more attractive to distributor organizations, Mr. Danley of Westinghouse listed the following means by which the industry might accomplish that end: "by providing suitable finance plans which would make it possible for the distributors to handle an increasing volume of business; by the coordination of sales effort in connection with syndicate buyers to make it possible for all distributing organizations to share in the business of such buyers; by making available for the distributor organizations standardized proposal forms, simplifying and standardizing the distributors' presentation to the prospective user; by the preparation of standard cost sheets which might serve as a guide for the distributor, preventing costly errors and omissions; and by factory-conducted engineering schools in which capable talent might be developed for the distributing organizations, and in which existing distributor

engineers could be trained in the most modern application methods."

Air conditioning, it seems pretty well agreed, should reach a new high in sales volume in 1938.

Economists Foresee Buying Surge

ALMOST everybody has been blamed for the current slump in business except Lo, the Vanishing Indian. Small business blames the monopolists. Big business blames the chiselers. Management puts the finger on labor; the unions point toward striking capital.

At last, however, comes the spokesman for one group who blames his own crowd, and makes out a right good case for his contention. He is Dr. Lionel D. Edie of New York, and his observations are seconded by Col. Edward P. Ayres of Cleveland.

A bull market in inventories was the prime cause for the recession, according to these two noted statisticians. And business men built up inventories in excess of needs, they declare, because they were misled by economists.

As Dr. Edie sees it, business men accumulated inventories in anticipation of higher prices after listening to economists argue that inflation was coming fast because of budget deficits and the accumulation of gold at high prices. These economists had failed to take note of the fact that the Washington money managers had reversed the monetary trend by taking important deflationary steps, such as the sterilization of gold and the raising of reserve requirements.

"The super-pessimists of today are bound to be wrong," declares Dr. Edie, for by fair means or foul, the situation will be turned around in 1938.

"Accordingly, 1938 is going to be a good year in which to put cash to work—a good year in which to accumulate stocks, to release plans for plant construction, to take advantage of the lower costs which I anticipate, to accumulate raw materials at cheap prices, and to build a home at a lower cost than will be available for several years thereafter."

"The inventory correction in retail stores will be substantially completed by the end of January."

This latter statement seems most important. It was generally reported by buyers and dealers visiting the furniture and home furnishings shows in Chicago the last fortnight that at the beginning of the "slide" last fall, store managements anticipated lower prices, and ordered all buying to cease.

This situation has prevailed until stocks—overloaded through the spring and summer—have sloughed off to normal, and are well on the road to depletion in many cases. Wholesale buying, then, will soon be in order.

Before recovery is to resume its upward march, however, ways and means must be found of inducing the liberal investment of private savings in enterprise as a means of restoring employment, uplifting buying power, and increasing production. Avenues which may lead toward this end include:

1. Revision of the undistributed profits tax and the capital gains tax, so as to promote the normal

flow of savings into profitable and productive use.

2. Preservation of the public credit through balancing the budget. This can be effected only by reduction of public expenditures at practically every point. When one-fourth of the national income goes toward the payment of taxes, entirely too much money is diverted from channels of consumption.

3. Fair and just treatment of employer-labor controversies, so that neither side can feel that the cards are stacked against them.

4. Cessation of government attempts to compete with private business, and to heckle it solely for political purposes.

5. Encouragement of the American principles of thrift, enterprise, initiative, self-reliance, opportunity, and service.

Business will no doubt struggle back to its feet with or without government cooperation, just as it has so many times in the past; but the removal of a number of obstacles such as those indicated above might speed up the process.

LETTERS

Coordinating Specifications And Trade-in Prices

Federal Refrigerator Corp.
57 East 25th St., New York City
Jan. 12, 1938

Publisher:

We know of no one else in the refrigeration industry that will be more interested and on whom we can rely to give us a more experienced and honest opinion than you can on this first refrigeration copyrighted "Blue Book" which is the 1937 sample edition.

The 1938 "Blue Book" of approximately 126 pages will be published very soon, listing every type and make from 1926 through 1937, with specifications and trade-in values. Distribution of same, we hope will be world-wide.

The need for this standard, guaranteed appraisal "Blue Book" is universally acknowledged. It is impossible, however, to exaggerate its importance to the effective development of the replacement market. Replacements represent a larger factor in the total refrigerator business with each passing month.

The "trade-in" grows in importance at exactly the same pace. An accepted, equitable "Blue Book" for trade-in appraisal thus becomes not only a convenience but an aggressive merchandise and promotion force.

We are enclosing a copy of the book and would ask you to please read carefully the introduction which explains fully the purpose of the book, and how it is to be used, and what we mean by "guaranteed valuations." We are most anxious to get your expression at your very earliest opportunity.

If you wish to reprint any part or all of the introduction, you have our permission to do so.

JOHN BESS,
Vice Pres. & Gen. Mgr.

Answer: Since you are in the business of buying used refrigerators and are willing to pay the prices listed, your "Blue Book" will apparently have the effect of establishing a definite scale of trade-in values in the area in which you operate.

We have had many inquiries for such a book and have given considerable thought to the possibility of including suggested trade-in values as additional information in our next Specifications Book, but so far, we have not been convinced that we could arrive at a satisfactory method of setting up these values.

Since the cost of setting up the type matter for specifications of all models of all makes for all years involves a great deal of expense, it has occurred to us that an economical plan might be worked out whereby our copyrighted Specifications Book (revised and brought up to date) would serve the purpose of furnishing the voluminous descriptive data.

It would then only be necessary to publish a supplement, or price list, showing the trade-in values for each of the models listed. Such prices might be determined by any buyer (or local group of dealers) according to market conditions in the territory served.

Cork Supply Not Stopped By War in Spain

Armstrong Cork Co.
Lancaster, Pa.

Jan. 10, 1938

Editor:

Our Technical Service Department has called my attention to an article in the Dec. 22 issue of your publication in which the following statement appears:

"One of the largest storage rooms in this section of the country, the space is approximately 230 feet long, 52 feet wide, and 10½ feet high. Since vegetable cork was scarce and expensive, because of the war in Spain, the company used rock cork insulation."

The statement was apparently based on a talk by H. C. LeVine of Atmospheric Control Co. of Detroit.

The above statement is not exactly founded on facts. While Spain always has been a large producer of cork, it is by no means the sole source of supply. Excellent cork is obtained from Portugal and Northern Africa, and American manufacturers have had no difficulty in obtaining adequate supplies of cork for their requirements despite the civil war in Spain.

I think you will admit that it is rather unfair to cork manufacturers to give the impression that there is a scarcity of genuine cork insulation. By the way, the only genuine cork is that which comes from the cork oak tree, and it is hardly correct to infer that any substitute constitutes "cork insulation."

I am calling these points to your attention, because I know you want to be fair in your editorial columns.

RALPH WINSLOW,
Assistant Advertising Mgr.

He's in the Market For Room Coolers

Utility Refrigeration Service

129 Oak Street (Rear)
Cumberland, Md.

Sirs:

We have been receiving your worthy publication AIR CONDITIONING & REFRIGERATION News regular for some time and will state it is well worth any one's time to read the News. We however have been disappointed in not receiving a copy of the Master Red Book altho we have filled in several postcards requesting a copy of same, and our subscription renewal stated this fact also.

We hope you will send us a copy so that we too will have a reference library of refrigeration and air-conditioning parts and supplies.

In conclusion we would like to have some literature on air-conditioning room coolers for restaurants of the individual self contained unit type. You may publish this letter if you care to so that we may contact air conditioning manufacturers interested in selling some of the above units to us.

Many thanks for past courteous help extended to us, we remain as ever,

P. A. AMTOWER, Prop.

He Wants the Good Work Kept Up

Joe Aigner
556 West 140th St.
New York, N. Y.

Jan. 9, 1938

Sirs:

I wish to extend my subscription for the AIR CONDITIONING & REFRIGERATION News and order the Manual No. E-1 "How to Select and Install Air Conditioning Systems" for which I am enclosing money order of \$5.00.

I have been very much pleased with the recent information which I received from the AIR CONDITIONING & REFRIGERATION News and the Manuals. Hoping the Business News Publishing Co. continues to make its News and Manuals valuable and interesting as up to now.

J. AIGNER

'How To Sell' Booklet Term'd Valuable

Climax Machinery Co.
121 to 153 E. Morris St.
Indianapolis, Ind.

Publisher:

Please accept our thanks for your booklet "How to Sell Air Conditioning." We have not yet had an opportunity to review its contents carefully, but feel that a publication of this character will be of benefit to the industry as a whole.

DEANE CHIVINGTON

The brochure, "Around the World with Candid Camera," is very interesting. I am taking this home for my library. May I congratulate you on the excellent work done by your publications.—F. M. Young, president, Young Radiator Co., Racine, Wis.

Survey of 3,000 Homes in Capital Shows High User Satisfaction With Electric Refrigeration

WASHINGTON, D. C.—That the trend of customer viewpoint upon electric refrigeration has been on the gallop recently and some of the sales approaches favored on the dope sheet have been left at the post was revealed in a survey currently completed by the Electric Institute of Washington, D. C.

The survey was made to determine what sales angles should be sharpened up for 1938 and to establish whether the hypotheses from which sales programs were being mapped had any basis in fact.

In several outstanding instances, conditions which were assumed to exist were not present at all.

The survey was conducted in 3,000 single family homes.

Noteworthy among the findings was the fact that of 2,250 electric refrigerator users interviewed, only 185 took advantage of a free checkup offer. The conclusion, according to Jack Bartlett, manager of the institute, is that the high percentage of satisfaction expressed in these figures makes it unnecessary for the industry to stress user satisfaction so heavily in sales campaigns for 1938.

"As a result of the high degree of satisfaction with electric refrigeration disclosed we plan to concentrate on increasing compensation for salesmen this season," says Mr. Bartlett.

"With satisfaction established sales effort requires stimulation. We plan to accomplish this with more emphasis on incentives such as contests. Sales meetings will also get more attention than they have in past seasons."

To illustrate how false premises based upon generalizations and incomplete data had previously received consideration in sales programs it was assumed that users would express dissatisfaction with the standard of service available for electric refrigerators. The survey revealed, however, that 94% of servicing was satisfactory.

Electric refrigerator dealers had also been under the impression, from the findings of other surveys, that gas refrigerators were being sold to previous electric refrigeration users in greater volume than the survey revealed. It was found that only 2% had used refrigeration previously.

"Some anxiety existed on the point that we had sold refrigeration but not electric refrigeration in previous campaigns with the result that the gas and ice boxes had climbed aboard our band wagon," says Mr. Bartlett. "The survey showed, however, that electric refrigeration was not giving ground."

Survey of 3,000 single family homes made by Daniel Starch & Staff for the Electric Institute of Washington.

Market

Of the 3,000 families 3.4% have an income in excess of \$5,000 per year, 56.9% have an income of from \$2,000 to \$5,000 per year, and 39.7% have an income of \$2,000 or less per year.

Of the 3,000 families 87.5% are white, and 12.5% are colored.

68.5% of the 3,000 homes are owner occupied and 31.5% are rented.

2.3% of families consist of 1 person
20.4% of families consist of 2 persons
26.0% of families consist of 3 persons
23.7% of families consist of 4 persons
13.1% of families consist of 5 persons
7.4% of families consist of 6 persons
3.5% of families consist of 7 persons
1.7% of families consist of 8 persons
.8% of families consist of 9 persons
.6% of families consist of 10 persons
.5% of families consist of 11 or more

The average family size is 3.8 persons.

Refrigerator Saturation

83.7% of the 3,000 homes use mechanical refrigerators.

2,250 Electric 75.00% of 3,000
261 Gas 8.70% of 3,000
482 Ice 16.07% of 3,000
7 None23% of 3,000

89.6% of the mechanical refrigerators are electric.

10.4% of the mechanical refrigerators are gas.

Electric Refrigerators in Use

Of the 2,250 electric refrigerator users:

17.5% previously used electric
.9% previously used gas

71 or 14.7% prefer ice
329 or 68.3% prefer electric
41 or 8.5% are undecided
Future preference of 2,250 present electric refrigerator users

90 or 3.92% prefer gas
2 or .08% prefer ice
2,090 or 93.00% prefer electric
68 or 3.00% are undecided.

The 90 persons who prefer gas refrigeration in the future gave reasons as follows:

9 or 10% "because of poor performance and noise of electric refrigerators."

13 or 14.6% because friends recommended gas.

38 or 42.2% indefinite.

20 or 22.2% "because gas has no moving parts, is silent, nothing to wear out, and free service."

5 or 5.5% "because of high repair cost of electric refrigeration."

5 or 5.5% "because they think gas cheaper."

Landers, Frary & Clark Names N. Y. Representative

NEW BRITAIN, Conn.—Fred J. Kahn has been appointed major appliance representative in metropolitan New York by Landers, Frary & Clark, manufacturer of Universal electric appliances.

Mr. Kahn's headquarters will be in the company's office in New York City. He formerly was associated with Bushwick-McPhilben Corp. of New York City.

James J. Ruch has been appointed eastern New York State representative for the Landers, Frary & Clark company, with headquarters in Albany.

Frigidaire's Staff for Birmingham Branch Is Announced

BIRMINGHAM, Ala.—The newly established Alabama and northwest Florida headquarters of Frigidaire division, General Motors Sales Corp., has started functioning in quarters at 600 North Seventh St.

Frigidaire has taken a two-story brick building for its operations here. General offices occupy the first floor front, and products and service parts are warehoused in the remaining space in the building.

In addition to Mr. Curl, who was transferred to Birmingham from Frigidaire headquarters at Dayton, the executive staff is made up of:

P. S. Dennison, district controller, formerly comptroller of the New Orleans district.

Earl Powell, commercial and air-conditioning sales manager, who formerly held the same position at St. Louis.

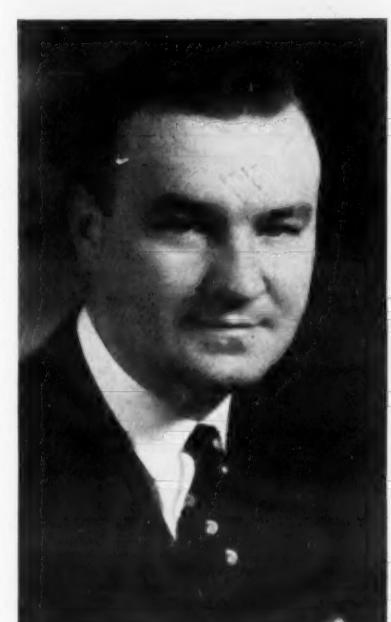
Marion Robertson, sales promotion manager, formerly a member of the promotional staff of the Alabama Power Corp.

Robert Reid, service and installation manager, formerly commercial and air-conditioning sales supervisor for Houston, Tex., district of the Norge division of Borg-Warner Corp.

W. F. Anderson, district sales supervisor, formerly in a similar capacity in the Boston district.

J. C. Hartline and A. M. Feltus, district sales supervisors.

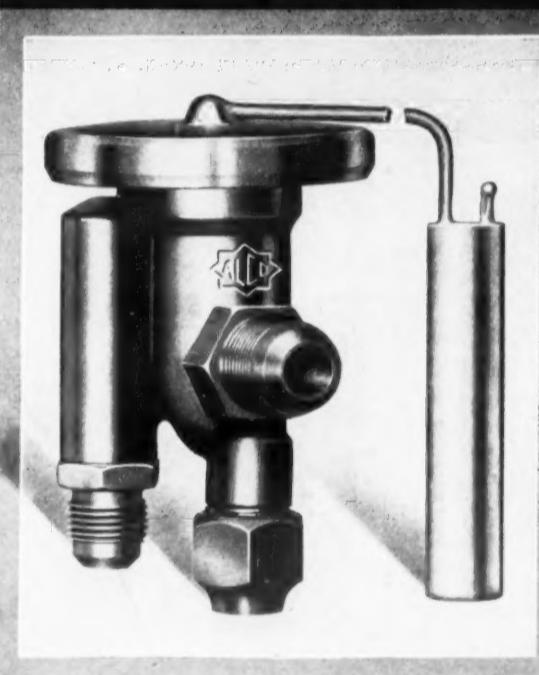
Scheel Heads Exports For Midwest Mfg.



GALESBURG, Ill.—Harry J. Scheel has been appointed export manager for Midwest Mfg. Co., according to an announcement by J. C. Battles, refrigeration sales manager. Mr. Scheel's headquarters will be in Chicago.

Mr. Scheel will handle Midwest's export sales in all foreign countries except Canada, where Bruce R. Donald, Brantford, Ont., remains sales representative, Mr. Battles reports.

Now You Can Save 20% to 40% on ALCO Small Capacity Refrigerant Controls With the New "TK" THERMO VALVE



Check these distinctive ALCO features of the New "TK" Thermo Valve:

- 1 Atomic hydrogen welded power assembly that reduces failures to an absolute minimum.
- 2 No bakelite parts—the entire valve will stand full test pressure without injury.
- 3 Large and completely adequate filter area—over 1 1/4 square inches of filter surface.
- 4 Light weight, simple design—yet as sturdy as all the larger Alco models.
- 5 Available in a variety of line sizes and capacities.



BUILT to traditional Alco standards of accuracy and trouble-free service, the "TK" incorporates all the proven advantages of the established Alco "T" Series Thermo Valves at a material saving in cost. Now Alco offers this high type control at a price within the reach of all small refrigeration and air conditioning systems.

The high type of control that is characteristic of every Alco Thermo Valve is essential if any system is to operate at the highest efficiency. Alco control keeps the line of complete evaporation within the narrowest of limits—utilizing the maximum amount of evaporator surface at all times. The Alco Model "TK" Thermo Valve makes such control available at a moderate price, suitable for small installations.

Write Alco or your Alco representative for complete information on the new "TK" Thermo Valve and for details of Alco's Engineered Refrigerant Control Service.

Type Valve	Refrigerant	Based on 1° Subcooling of Liquid at Valve Inlet						Stand. Length Capillary Tubing	Size Connections
		30lb	40lb	50lb	60lb	70lb	80lb		
TKOF	Freon	.25	.27	.29	.30	.31	.32	.32	1/2"
TK1F	Freon	.95	1.05	1.10	1.15	1.20	1.25	1.25	2'
TK2F	Freon	2.00	2.20	2.40	2.50	2.60	2.70	2.80	or 3/8"
TKOM	Methyl Chloride	.50	.54	.58	.60	.62	.64	.64	5'
TK1M	Methyl Chloride	1.90	2.10	2.20	2.30	2.40	2.50	2.55	SAE 3/8"
TK2M	Methyl Chloride	4.00	4.40	4.80	5.00	5.20	5.40	5.60	SAE 1/2"

*Furnished with Internal Equalizer and External Remote Bulb Only—Outside Adjustment.

ALCO VALVE COMPANY, Inc.
2620 BIG BEND BLVD. ST. LOUIS, MISSOURI



FOR HIGHEST EVAPORATOR EFFICIENCY

ENGINEERED REFRIGERANT CONTROLS

See this valve on the Glass Evaporator at Alco's Booth No. 248-9; International Heating and Ventilating Exposition.

New Design Improvements by York Place Emphasis on Space Saving, Quiet Operation

(Continued from Page 1, Column 5) servation, their design having been created to bring out the inherent quality of the products.

In describing the functions of the designer in the creation of air-conditioning equipment, Mr. Teague stated that it was necessary to "study the trends of style in all types of merchandise from women's clothing to houses, consider the tastes of the time, and observe things people are buying."

"People with advance tastes are ready-made prospects for air conditioning," Mr. Teague continued. "They prefer the clean simple lines of modern speed boats, smart cars, and streamlined railway trains. These people have an appreciation of fine living and air-conditioning units must be keyed to their standards. For this reason the new York units have the simple, chaste appearance that appeals to people who buy fine things."

The portable Yorkaire conditioner, model BA-90, which is the type of unit commonly referred to by the air-conditioning industry as a "room cooler," incorporates a number of refinements in design and mechanical operation, York engineers declare. Capacity of the unit is slightly under 1 ton, which is adequate to meet the requirements presented by most rooms of ordinary size in all climates.

Chief among the new features of the portable Yorkaire is an adjustable rotary grille which diffuses the conditioned air to meet individual preferences and room characteristics. Air direction from the rotary grille may be established in a vertical or horizontal plane, or any desired intermediate point.

Outdoor air is introduced to the portable unit through an adjustable damper, controlled from a convenient point on the top of the unit. This "finger-tip" control panel allows for personally selected performance and seasonal operation.

Both outdoor air and recirculated air are mixed before passing through a large filter. A rapid room exhaust makes possible the replacement of all air in the room by the introduction of outside air. This is said to be of particular benefit in offices and other rooms where heavy smoking may be in progress.

The window adapter, which is adjustable in size, contains the fresh air inlet, condenser air intake, and condenser air exhaust. An advanced feature of the unit is the method

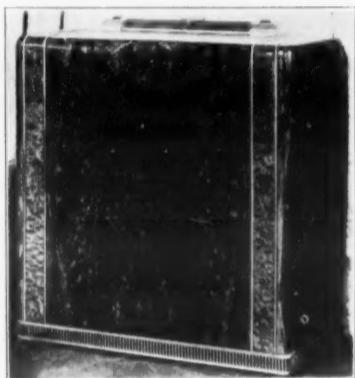
used to dispose of the condensate from the finned cooling coils.

Since the first room coolers were placed on the market by the York company four years ago many refinements have been devised to reduce noise. The compressor and its motor are mounted as low as possible in the cabinet and are isolated from the base by an effective spring mounting.

Like the "floating power" automobile engine, the entire compressor assembly "floats" on springs; free from the chassis of the unit. Air velocities through the large cooling coil are low, which reduces the sound of rushing air. The Yorkaire is compact, requiring approximately 4.3 sq. ft. of floor space.

In welcoming delegates to the convention President W. S. Shipley of the York Ice Machinery Corp. expressed great optimism for sales

Yorkaire Portable



Adjustable rotary grille on top of unit is a prime new feature.

of "portable" and "self-contained" air-conditioning units during 1938. Mr. Shipley said that "a well balanced organization of young men, middle aged men, and mature men could do an outstanding merchandising job during the coming year without regard for economic conditions."

Mr. Shipley discounted the present recession by saying that "the American people have a habit of calling every little let-up a depression. Business should not argue with government, but should, like the well advised married man, read the paper, and hold its tongue. Industry should create work and wealth while the

rings seal tightly, and the patented York "centriforce oiler" eliminates possibility of lubrication failure.

Yorkaire self-contained units will be shipped and handled in sections. The bottom section contains the complete refrigeration system and cooling coil, so that the system is shipped completely charged with Freon. The charge of refrigerant and operation of the system is fully checked at the factory before shipment. The units are quickly and easily installed and may be moved from one store location to another in case the owner of the business makes a new lease.

Designed by Walter Dorwin Teague, the units will add a decorative touch to any interior. Stainless steel supply grilles simplify control of air distribution and give the conditioners a quality appearance.

For installations in excess of 5 tons the York company has developed a line of "sectional" air conditioners designed in a manner that permits many optional arrangements in the field.

The new line of air units will include conditioners of the finned coil type for human comfort applications, dry coil type for industrial process work, spray type, and new wetted surface conditioners for packing plants and similar requirements where control of humidity is essential.

Sectional conditioners are available in one, two, and three fan assemblies, with capacities ranging

Chief Engineer Speaks



Lew Williams tells distributors about design improvements in new models.

the fan deck permits several alternate arrangements for the connection of ductwork. Assembly may be made in a manner that permits air discharge in 8-foot head room which is said to be an advantage where low basements are encountered in air-conditioning work.

Paralleling the redesign of these air handling units, a new series of York finned coils for direct expansion F-12, chilled water, and non-electrolytic brine applications have been developed by the company, according to J. R. Hertzler of the engineering staff.

In describing the relationship between the new conditioners and the coils, Mr. Hertzler declared that the new York finned coils made possible the building of conditioning units that have less cubic volume per ton of gross output than had been possible heretofore.

Reason for this saving in space is attributed to the fact that the new coils employ $\frac{1}{2}$ in. O.D. copper tubing rather than the conventional $\frac{3}{4}$ in. O.D. tubing used before, with fins having six bends to the inch rather than four.

While the actual weight of copper going into the coils has been materially reduced, the coil efficiency has been increased to the point where depth of coil necessary for a given result may be decreased by about 25%. This feature reduces the actual size of coil necessary for any capacity required, and makes possible the building of smaller air-handling units.

EVAPORATIVE CONDENSERS

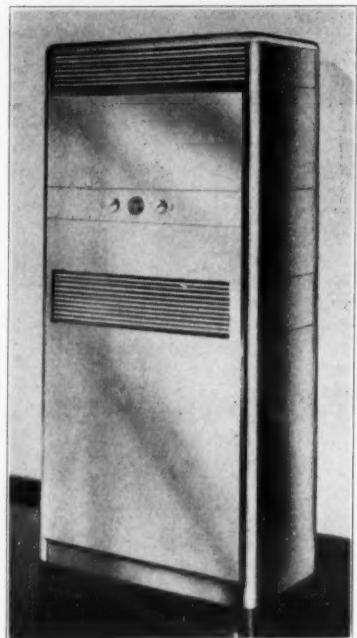
In many cities alarm over demands on the available water supply and potential capacity of sewers has brought about legislation governing the use of water in air-conditioning installations, asserted W. E. Barnum in describing the new York line of evaporative condensers.

Quoting the New York Times for Dec. 19, 1937, Mr. Barnum stated that the air-conditioning industry will not be halted by a lack of water, as cooling towers and evaporative condensers make it possible for the larger systems to conserve 90% of the water formerly required.

To meet this condition York has a full line of "economizers" available, which employ the special $\frac{1}{2}$ inch coil used in the sectional conditioners. All metal exposed to the elements is especially treated to prevent any possible deterioration and in-

(Concluded on Page 13, Column 1)

Stylish Design



The new York self-contained conditioners in 2.75 to 4.75 tons capacity have compact, modish cabinets.

politicians are taking off into space, and not argue with the government. Business should forget politics and go back to work."

Referring to the new self-contained York units, now available in capacities of 2.75, 3.50, and 4.75 tons, Llewellyn Williams, chief engineer of the company, stated that "air-conditioning jobs should not be designed for the 10 worst days in the cooling season, but rather to meet optimum conditions during the year."

Mr. Williams pointed out that the new self-contained units would give comfort cooling conditions in thousands of stores and shops where design duct systems were impractical and expensive. Emphasis was also placed on smoke removal and adequate ventilation as the more important factors in a good air-conditioning system.

The new self-contained air conditioners combine in a single cabinet all the elements necessary for both summer and winter conditioning—a refrigerating unit, cooling surface, air circulating fan and filter, heating surface, and humidifier. The units also have outside air connections to assure proper fresh air supply and ventilation.

While the new units take up less than half the floor space occupied by the first self-contained air conditioners produced by the company five years ago, they incorporate all the outstanding features of York equipment, according to engineers of the company.

Compressors have patented "Balansel" seals, which are said to cut friction losses to a minimum; valve trouble is eliminated by full opening valves; the short crankshaft made possible by the "Balansel" reduces whip and bending; the special piston

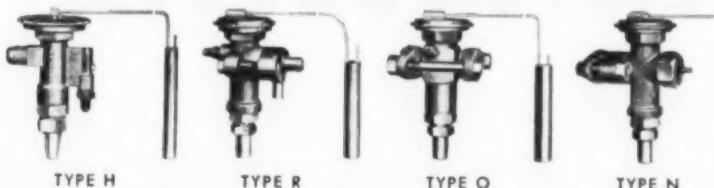
from 7 $\frac{1}{2}$ to 40 tons. Air deliveries run from 2,500 c.f.m. to 8,000 c.f.m. on the largest unit.

Units are shipped in sections, and may be assembled on the job in a manner to fit the particular space requirement encountered. Separate parts of the conditioners are designated as fan section, coil section, air intake and filter section, and control section.

All controls are accessible, and

Start the Year Right!

use SPORLAN THERMOSTATIC EXPANSION VALVES FOR YEAR IN, AND YEAR OUT DEPENDABILITY



YOU CAN INSTALL SPORLAN VALVES with CONFIDENCE

SPOEHRER-LANGE COMPANY

3725 Commonwealth Avenue • ST. LOUIS, MISSOURI

TEMPRITE

INSTANTANEOUS BEER and WATER COOLERS

Detroit

Michigan

Compressors



MERCHANT & EVANS CO.
Phila., Pa., U.S.A. Plant at Lancaster, Pa.

PERFECT AS Nature ITSELF

EXTRA DRY ESOTOO
PRODUCT OF
VIRGINIA SMELTING CO.
WEST NORFOLK, VA.

As the snowflake is a perfect work of Nature, so is EXTRA DRY ESOTOO the perfect refrigerant . . . perfectly moisture-free, perfectly pure, perfectly uniform. It's the precision refrigerant specified by designers of perfectly automatic refrigeration. ESOTOO is so much a standard among engineers and service men that it is available for instant delivery in every part of the world.

New Devices Will Be Seen at Grand Central Palace Next Week; Engineers' Societies Meet

(Continued from Page 1, Column 3) correct humidification during winter, and refrigeration (to the extent of lowering room temperature 10°) during summer.

An all-purpose unit heater will be shown which can be operated at pressures from atmospheric to 250 lbs. steam. A thermal unit automatic humidifier made by the same company is said to guarantee any desired degree of room humidity.

A manufacturer of winter air-conditioning systems will feature metal floors underlying the entire cabinets. This feature is supposed to prevent dust from entering the bottom, and also to facilitate the maintenance of optimum air pressure inside the cabinet.

Among the many control devices on display will be a three-point micro-balanced controller providing for control of inside temperature, outside temperature, and radiator output temperature. A new duct controller is said to relieve hot and cold blasts, and an automatic orifice valve automatically maintains the desired radiator saturation.

One of the new air-diffusion devices guarantees even distribution of any volume of air, at any velocity, without draft. A similar device also claims to prevent drafts in air-conditioned rooms or in rooms provided with forced ventilation.

The show is sponsored by the A.S.H.V.E. and has been arranged

under the personal direction of Charles F. Roth, president of International Exposition Co. More than 300 manufacturers will exhibit, and a registered attendance of over 30,000 is anticipated.

The three-day A.S.H.V.E. convention, which opens Jan. 25, will devote its first session to a discussion of food refrigeration, its second to fluid flow, its third to technical and theoretical refrigeration problems, its fourth to air conditioning, and its last to refrigerating machinery.

In addition, Johnson O'Connor, Human Engineering Laboratory, Stevens Institute, Hoboken, N. J., will give a luncheon talk on "Engineering Humanics," and Louis Ruthenberg, president, Servel, Inc., will informally discuss "Industrial Relations."

Annual dinner dance of the society will be held Jan. 26 in the Henrik Hudson room of Hotel Roosevelt, A.S.H.V.E. headquarters.

Technical program of the A.S.H.V.E. will consist of five sessions devoted to discussion of various air-conditioning problems and developments. A total of 14 technical papers will be presented during the four days. Although convention registration is scheduled for Jan. 24, technical discussions will not begin until the next day.

An address by Dr. A. C. Willard, recognized air-conditioning authority and president of the University of

Illinois, will start off the sessions of the National Warm Air Heating and Air Conditioning Association on Jan. 25. Following this, a talk will be given on present business conditions. The remainder of the discussions will be concerned with various technical problems of the industry.

Members and guests of all three organizations will join in a party to be held Jan. 25 at the International Casino, Broadway night club.

Exhibitors at the Show

American Gas Accumulator Co., Elizabeth, N. J.; American Metal Hose Branch, The American Brass Co., Waterbury, Conn.; Adams Engineering Co., Chicago; Advance Engineering Co., New York City; Aerofin Corp., Syracuse, N. Y.; Air Conditioning Blue Book, Chicago; Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland; Air-Maze Corp., Cleveland; Altemp, Inc., Dayton; Airtherm Mfg. Co., St. Louis; Baldwin-Hill Co., Trenton, N. J.; Ballofett Dies and Nozzle Co., Inc., Guttenberg, N. J.; Barber-Colman Co., Rockford, Ill.; Barnes & Jones, Inc., Boston; Beaton & Cadwell Mfg. Co., New Britain, Conn.

Alco Valve Co., Inc., St. Louis; Allis-Chalmers Mfg. Co., Milwaukee; Alpha Steam Specialty Co., New York City; American Artisan, Chicago; American Blower Corp., Detroit; The American Brass Co., Waterbury, Conn.; American Gas Products Corp., New York City; American Machine and Metals, Inc., DeBothezat Ventilating Equipment Div., New York City; American Oil Burners & Heating Utilities, Brooklyn, N. Y.; American Radiator Co., New York City.

American Rolling Mill Co., Middlebury, Ohio; American Society of Heating and Ventilating Engineers, New York City; American Steel & Wire Co., Chicago; Anchor Post Fence Co., Fluid Heat Div., Baltimore; Anderson Products, Inc., Cambridge, Mass.; Anemostat Corp. of America, New York City; Anthracite Industries, Inc., New York City; Arm-

strong Machine Works, Three Rivers, Mich.; Armstrong Steam Trap Co., Three Rivers, Mich.

Auer Register Co., Cleveland; Auto-Heat Corp., New York City; Automatic Burner Corp., Chicago; Automatic Heat and Air Conditioning, Chicago; Automatic Products Co., Milwaukee; Automatic Temperature Control, Inc., New York City; Autovent Fan & Blower Co., Chicago; Air Devices Corp., Thermal Units Mfg. Co. Div., Meriden, Conn.; Aldrich Co., Peoria, Ill.; American Air Filter Co., Peoria, Ill.; Consumers Petroleum Corp., New York City.

Davidson Fan Co., Newton, Mass.; Davies Air Filter Co., New York City; Dayton Rogers Mfg. Co., Minneapolis; Dayton Rubber Mfg. Co., Dayton; DeBothezat Ventilating Equipment Div., American Machine and Metals, Inc., New York City; Delco-Frigidaire Conditioning Corp., Dayton; Detroit Lubricator Co., Detroit; Dole Valve Co., Chicago; Domestic Engineering Co., Chicago.

Dreis & Krump Mfg. Co., Chicago; C. A. Dunham Co., Chicago; Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.; Dupont Fuel Oil Burner Co., Inc., Brooklyn, N. Y.; S. R. Dresser Mfg. Co., Bradford, Pa.; Walter F. Dooley, Boston, Mass.; Detroit Air Meter Co., Detroit; Donigan Electric Mfg. Co., Detroit; Gold Star Oil Burner Mfg. Co., Inc., Yonkers, N. Y.; Eagle-Picher Sales Co., New York City; Economy Pumping Machinery Co., New York City; Electrol, Inc., Clifton, N. J.

Emerson Electric Mfg. Co., St. Louis, Mo.; George Evans Corp., Moline, Ill.; Electronic Control Corp., Chicago; Electric Air Heater Co., Mishawaka, Ind.; Fairbanks, Morse & Co., Chicago; Fairfield Oil Heating Co., Inc., Greenwich, Conn.; Feeders Mfg. Co., Inc., Buffalo; Field Mfg. Co., Chicago; Fitzgibbons Boiler Co., Inc., New York City; Fluid Heat Div., Anchor Post Fence Co., Baltimore; Fox Furnace Co., Elyria, Ohio; Frick Co., Furnaces, Inc., Baltimore; Fuel Oil Journal, New York City; Fulton

(Concluded on Page 17, Column 2)

'Pressurevent Vibradamp' Is New Device Used in York Oil Burner Unit

(Concluded from Page 12, Column 5) increase the length of usable life of the economizers.

Statistics were cited by Mr. Barnum showing the growth of the use of evaporative condensers during recent years, and a chart was discussed, showing how the original cost of an "economizer" could be amortized over a period of years when charged off against the cost of condensing water.

HEATING SYSTEMS ANNOUNCED

"Realizing that the air-conditioning business depends on sales of 'winter' air conditioning to flatten out sharply fluctuating sales curves, the York Ice Machinery Corp. enters the automatic heating industry for the first time in 1938," said E. R. Walsh, Jr. in presenting a new oil boiler and winter air-conditioning unit.

"Winter and summer air conditioning cannot be considered as two separate industries," Mr. Walsh continued, "but are closely related functions that may best be handled by one manufacturer and installed by one contractor who is responsible for the entire installation.

New boiler-burner units offered by the York company were described by G. R. Wachter of the engineering staff. The boiler is of sectional cast iron construction and combines the most advanced principles of extended heating surface and matched oil burner efficiency.

"Because of the presence of radiant heat, the direct heating surface in any boiler is seven times more valuable than the indirect surface," Mr. Wachter said. "For this reason the York boiler was designed with ample consideration given to the proper relationship between direct and indirect heating surface, in order to assure the most efficient heat transfer possible."

To secure all possible advantage of direct heating surface the York boiler employs the extended water leg design, the water passing entirely under the pre-cast "francite" combustion chamber. Hot gases are brought in intimate contact with secondary surfaces by means of fins on the surfaces of the cast sections. Radiation loss from the boiler is reduced by abestocel insulation.

The boiler is fired with a pressure atomizing oil burner having two distinct features, the first being the "pressurevent vibradamp," a device controlling the internal pressure of the boiler.

It is well known that back pressure in an oil-fired boiler is caused by changes in weather, in draft conditions, and in the type of fuel oil used, this pressure causing a

rumbling and vibration in the system. Another manifestation of this condition is the "puff back" of hot gases from the burner, well known to all oil burner engineers.

According to Mr. Wachter this difficulty is eliminated by the pressurevent vibradamp. This device permits excess gas accumulating in the boiler to pass back to the air intake on the oil burner and thus be sent through the unit a second time.

The unit acts as a "relief" vent against excess back pressure in the boiler, stabilizes internal draft conditions in the system, and in this way eliminates vibration and rumbling. By controlling pressure conditions in the boiler its efficiency is increased while smoother operation is made possible, according to Mr. Wachter.

Another feature of the York oil burner is an adjustable cold air regulator in the draft tube of the burner which permits reduction of the oil firing rate to $\frac{1}{2}$ gallons per hour without loss in burner efficiency. As conventional pressure burners not having a special device of this kind have a minimum firing rate of 1.35 gallons per hour, it becomes possible to adapt the York boiler-burner to smaller homes, with resulting high efficiencies, Mr. Wachter claimed.

Besides the York oil burner unit the company will also offer a complete line of winter air-conditioning units for residential use in combination with the boiler.

These units will be vertical in character, contain heating coils, filters, humidifier for winter air conditioning and provide for cooling coils to be installed in the future. Heating and cooling output ratings will correspond with the conventional size of homes, and air delivery will be accomplished by means of a single, centrifugal fan unit.

ADVERTISING

Advertising and merchandising plans for the coming year were outlined by F. Chalmers, J. L. Rosenmiller, and C. R. Marshall. Catalog folders covering all new products are now available to the entire distributing organization, together with new mailing pieces and sales helps.

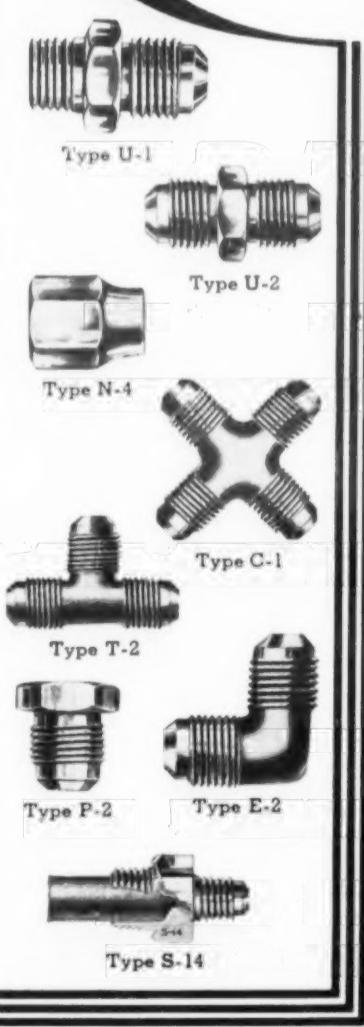
All advertising for 1938 will be basically institutional in character, but will feature specific reference to outstanding York installations.

Consumer advertising will be extended to The Saturday Evening Post, Time, Fortune, Business Week, the "portable" air conditioner will be advertised in The New Yorker and three magazines of the household group, House Beautiful, Town and Country, and House and Garden, will be used for the first time.

KEROTEST

Refrigeration Quality Fittings

MADE TO CONFORM TO THE STANDARDS
of the REFRIGERATION VALVES and
FITTINGS ASSOCIATION



For the ultimate in dependability, specify Kerotest—the standard of quality throughout the modern refrigeration world . . . heavily constructed especially for Mechanical Refrigeration, Air Conditioning and High Pressure Bottled Gas Service . . . NOT to be confused or compared with the ordinary types of fittings.

The allowable tolerances and rigid inspections of Kerotest Refrigerator Fittings make them far superior to those used in low pressure work such as oil burner or automotive installations.

Complete data and specifications are listed in the Kerotest Refrigeration Catalog—a valuable booklet. Write for your copy, if you do not already have one.

KEROTEST MANUFACTURING CO.
PITTSBURGH, PA.

KEROTEST

Westinghouse Points New Warm Air Unit For \$250,000,000 Residential Market

(Concluded from Page 1, Column 1)
all-year conditioning; 2. A winter air-conditioning system, comprising the four factors first named above; 3. Provisions for the future addition of a summer air-conditioning system, as a required matched addition to the winter air-conditioning system.

"Every old house will need rehabilitation of its present heating system to replace or augment depreciated and obsolete equipment with a modern automatically controlled home comfort system.

"Every house, in the past, has needed a water supply, a sanitary system, a heating system, artificial illumination, cooking equipment, laundry equipment, a telephone, and an automobile. All these things have been supplied.

"In the same manner, every house, both now and in the future, will need a planned home comfort system, for without it the house will become prematurely obsolete, with a resulting loss to the owner.

"The second thing we found was that the average annual one-family house market is about 280,000 for a normal year. In 1925, the all-time high of 546,000 one-family new houses was reached. This fell away to a low of 41,000 one-family houses in 1934."

Between the years 1920 and 1936, one-family new house construction ranged as follows, Mr. Stangle's report showed:

1920—158,000; 1921—278,400; 1922—401,000; 1923—485,000; 1924—513,700; 1925—546,800 (high); 1926—492,800; 1927—467,000; 1928—408,300; 1929—296,500; 1930—181,800; 1931—147,300; 1932—50,800; 1933—42,900; 1934—41,000 (low); 1935—96,400; 1936—191,600.

Average for the 16-year period is 282,300 per year.

Average cost of the lot upon which a house was built was 16.4% of the property valuation, with a corresponding building value of 83.6%.

Average annual one-family house normal market of 282,000 one-family houses could be broken down into price brackets, and from this the volume markets, based on past performance, could be predicted for the first time, Mr. Stangle said.

This break-down revealed that the great majority of the single-family houses in an average year would be built on property valued between \$3,000 and \$12,000, with the largest number of homes concentrated in the value classes between \$4,000 and \$8,000.

Estimating Type & Value Of Home Conditioners

Type and value of heating and air-conditioning systems permissible in these houses could be approximated, Mr. Stangle said, by allowing reasonable percentages of the house values for the systems.

Houses in the \$2,000 and \$3,000 property valuation class allow a system valuation of but 5%, which permits only the simplest type of system; houses in the \$4,000 and \$5,000 class allow a system valuation of 10%, permitting a simple type of heating system; houses in the \$6,000 and \$7,000 class allow a system valuation of 15%, permitting the installation of winter air conditioning; while all houses above \$7,000 have sufficient allowance to permit installation of an all-year conditioning system. (Table 1).

"Estimated annual saturation market for completely installed systems in new houses reached the sum total of \$254,072,280 as a potential market," Mr. Stangle continued. (Table 2).

"Estimated manufacturers' billings in new houses at 33 1/3% of installed cost, for the average annual saturation, is about 85 million dollars.

"Third thing we found was that the rehabilitation of old house heating provided another large market, conservatively estimated at more than 21 million more.

"Total of the apparent new and old house heating air-conditioning market, based on the anticipated normal annual market, is \$106,153,161.

"No one can predict futures with a degree of accuracy. The best that can be done is to project from the past, using trends and influencing factors, to forecast the future," Mr. Stangle went on. "When this is sincerely done, confidence in, and understanding of, the objectives and methods are the result."

In his discussion of product development, Mr. Stangle said:

"Because air-conditioning deals in air, the public has been quick to make its own decisions, upon which the trends as to the type of equipment are indicated. There has been a general and increasing acceptance on the part of the public for direct-fired forced warm air, due in part, we believe, to the fact that the total effect of winter air conditioning can be obtained for less money, with this type of equipment, than with the relatively more expensive equipment used in the steam heated type of auxiliary or split air-conditioning systems.

"And, too, the concerted effort and wide publicity of the National Warm Air Association has undoubtedly had its effect upon the buying public; the research work carried on by this organization at the University of Illinois needs no comment, save one of commendation.

"We have adopted the direct-fired warm air winter air-conditioning system as our product for new houses, and where they can be used to replace present gravity warm air systems in old houses.

"The rehabilitation market has not been ignored, and, where re-

Table 1—Cost of System by Type of Home

Property Valuation	TABLE 1—HEATING AND AIR-CONDITIONING VALUES AND SYSTEMS IN NEW HOUSES			
	House Value	System Per Cent	Value Dollars	Type of System
\$0-2,000	\$ 1,758	5%	\$ 88	Simplest
3,000	2,568	5%	128	Simplest
4,000	3,412	10%	341	Simple
5,000	4,335	10%	434	Simple
6,000	5,084	15%	755	Winter Air Conditioning
7,000	5,873	15%	881	Winter Air Conditioning
8,000	6,664	20%	1,332	All-Year Air Conditioning
9,000	7,461	20%	1,492	All-Year Air Conditioning
10,000	8,230	20%	1,646	All-Year Air Conditioning
12,000	9,828	20%	1,966	All-Year Air Conditioning
15,000	12,240	20%	2,448	All-Year Air Conditioning
Over 15,000	11,970	20%	2,394	All-Year Air Conditioning

quired, an indirect auxiliary or split system will be made available.

"From the data obtained in the market analysis, the size of the equipment which is needed to meet the market requirements was determined.

"Type and size of equipment being established, the product was developed. Reasonable unit costs of construction were assumed, as national averages, it being recognized that considerable variations might exist. Dividing the bracketed house valuations by these unit costs reduced each class of house to a relatively estimated cubage.

"A standard house, one for each cubage, was designed and theoretical heating and cooling loads (expressed in c.f.m. of air, and in B.t.u.) were determined" (Table 3).

Will Sell Systems Through Distributors-Dealers

Turning next to distribution methods, Mr. Stangle continued:

"There are several methods of distribution having to do with equipment that makes up a home comfort system. Fundamentally, there are two methods that have apparently been successful, each depending, however, upon limited and peculiar characteristics of the individual organization.

"One method is the direct factory branch selling organization.

"The other method is the distributor-dealer selling organization, and the time-proven method upon which Westinghouse and its dealers have operated in the past. We believe that the distributor-dealer method of merchandising home comfort systems has many advantages.

"Our selling plan is also built around the distributor-dealer method.

Residence Units to Be 'Home Proved'

Westinghouse will "home prove" its residential air-conditioning equipment in much the same manner as it is "kitchen proving" its refrigerators and ranges.

Objectives of the 1938 home conditioning program, as outlined by Roger Bolin, George Park, and Tom Kalbfus, are to accomplish the following purposes:

1. Direct, independent source of prospects; 2. Sell the owner first; 3. Effectively contact the building industry factors; 4. Use leads to get leads; 5. Cultivate the speculative

ing, and lists features of Westinghouse equipment.

Third and fourth objectives are met through the distribution of specification sheets on Westinghouse equipment to all local building factors, and the use of installation signs to attract new prospects to the homes in which systems are placed.

To work the market in present homes, dealers will offer free inspection service, which involves inspecting the heating system, noting the possibilities for installing modern equipment, and preparing a survey followed by a proposal. Personal canvass of the older residential sections is advised to uncover prospects for both replacement and new equipment.

Actual user tests of Westinghouse home comfort systems will be made, as the most effective way of promoting sales of the equipment.

The "Home Proving" program, as it is called, consists of a series of tests, allotted one to each authorized dealer, which will be conducted on a monthly basis through a period of one year. Results each month will be tabulated as soon as they become available, and a running account of the home proving experience will be made available to district offices, dealers, and salesmen.

After appointing a man to act as supervisor of the test, the dealer selects an average family which is building a new home and which will install the equipment. A separate meter is installed, in the case of gas-fired units, or a definite check of oil consumption is arranged for, in the case of oil-fired equipment.

Inside and outside temperature and humidity readings are taken regularly throughout the test, the reports being made by the family owning the home, with the assistance of the supervisor. A special test panel, showing total current used, blower running time, and burner running time, is installed. Health records of the test family, before and after installation of the equipment, also will be made.

Imhoff & Danley Predict Popularity of 'Package'

In brief talks to the distributors and dealers attending the meeting, both R. E. Imhoff, merchandise department sales manager, and P. Y. Danley, manager of the refrigeration and air-conditioning department, said that air conditioning, in the future, will be more and more a "packaged" business.

Like the refrigeration business, air conditioning must pass through the period in which it is an expensive engineering procedure before becoming simpler and less expensive, Mr. Danley said. When this is accomplished, he declared, air conditioning will be a "packaged" business, in which mass production will effect a larger volume of sales at a much lower unit cost.

When this time comes, the business will be handled much more satisfactorily by men who understand merchandising methods, he contended.

Westinghouse's reason for going into the winter air-conditioning field is the company's belief, Mr. Danley declared, that the dealer who sells the winter system will be the logical first choice when summer cooling equipment is considered. Heating and cooling should go together, he said.

STREAMLINE FOR SAFETY AND ACCURACY IN PIPE FITTINGS

TRADE MARK REG. U. S. PAT. OFFICE



REFRIGERATION AND AIR CONDITIONING

• The STREAMLINE Solder Fitting is the only solder type fitting on the market in which POSITIVE PROOF of a leak-proof joint can actually be seen without resorting to a pressure test.

There is no guess work about STREAMLINE. The solder inserted through the feed hole (an exclusive feature) completely seals the bonding surfaces, and its appearance at the end of the fitting assures you, beyond all doubt, that the joint is refrigerant proof, that vibration cannot work it loose, and that it is permanent and actually stronger than the tube itself.

STREAMLINE Forged Brass Fittings are furnished in complete range in couplings, tees, elbows, etc., with male and female ends and in reducing sizes. Send for Catalog and Price List 2003 illustrating our complete line of Valves, Fittings (solder type and flare), Dehydrators, Strainers, etc., for Mechanical Refrigeration.

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Dealers and distributors, write or wire today for details of the New Governair room cooler and the attractive profit-making franchise.

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• Designed IN a hot climate; built to fit the moderate budget without sacrifice of quality, efficiency or appearance. Welded steel frame; all standard parts; rubber mountings; walnut cabinet. On ball-bearing rollers for easy moving from one room to another. Cools, ventilates, circulates, dehumidifies and cleanses the air. Low-cost operation . . . and a low first cost that makes every family of average means a prospect!

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Gas-Burning Engines Finding Use With Air-Conditioning Systems Where Conditions Are Favorable

By Henry Knowlton, Jr.

DETROIT—Adaptation of the light automotive type engine, such as the Ford V-8, to the operation of refrigeration and air-conditioning equipment, using natural gas as a fuel, presents a new low cost source of power, gas utility company engineers are declaring.

Although natural gas as a fuel for internal combustion engines has

sors, cotton gins, shop machinery, and generation of electric power, it is the air-conditioning and refrigeration industry that has found one of the more logical uses for this type of power. Adaptation of light gasoline type engines for use with natural gas is opening an entirely new field of power development.

An important factor in this devel-

Catching Up with a New Development

In sections of the country where gas rates are favorable, gas-burning combustion engines are finding application as low-cost driving element for machines, including such equipment as compressors for refrigeration and air-conditioning installations.

All phases of this development are discussed in this article in a manner to give the reader as much practical information as was obtainable on the subject.

been used for over 40 years, it is only within the last decade that light automotive type engines have been placed in this type of service. First applications were in the south and southwest where second hand motors were "rigged up" to run oil well machinery and machine shops.

While heavy duty gas engines have long been used for air compres-

sors, cotton gins, shop machinery, and generation of electric power, it is the air-conditioning and refrigeration industry that has found one of the more logical uses for this type of power. Adaptation of light gasoline type engines for use with natural gas is opening an entirely new field of power development.

In many areas the gas companies supply thousands of residential heating systems during winter months, and it becomes obvious that during summer months these companies can well afford to give a promotional rate to quantity users of gas.

PROMOTIONAL RATES

Certain utilities have recognized the possibilities presented by this market and offer an attractive summer rate. The Detroit City Gas Co. has established a rate of 30 cents per Detroit Gas Unit (530,000 B.t.u.) which amounts to approximately 57 cents per thousand feet of 1,000 B.t.u. gas, from April 1 to Dec. 1. According to Detroit City Gas Co. engineers the heat content of this gas is slightly over 1,000 B.t.u. per cubic foot.

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For Information on Motors
FOR ALL TYPES OF
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GR COMMERCIAL REFRIGERATION

Write for information about latest GR-Lipman developments.

GENERAL REFRIGERATION CORPORATION
Dept. F-3, Beloit, Wisconsin, U.S.A.

SERVEL
COMMERCIAL REFRIGERATION
AND AIR CONDITIONING

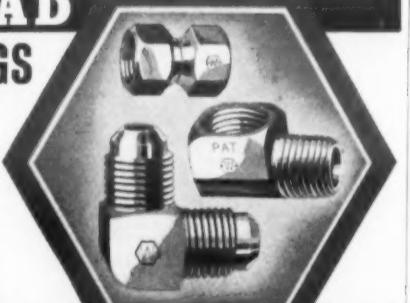
Write for details to Servel, Inc., Electric
Refrigeration And Air Conditioning Division, Evansville, Ind.

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- Flat-sided, for easy, non-slip installation.
- Styled in keeping with modern trends.
- Greater density... greater strength.

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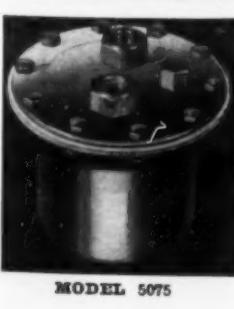
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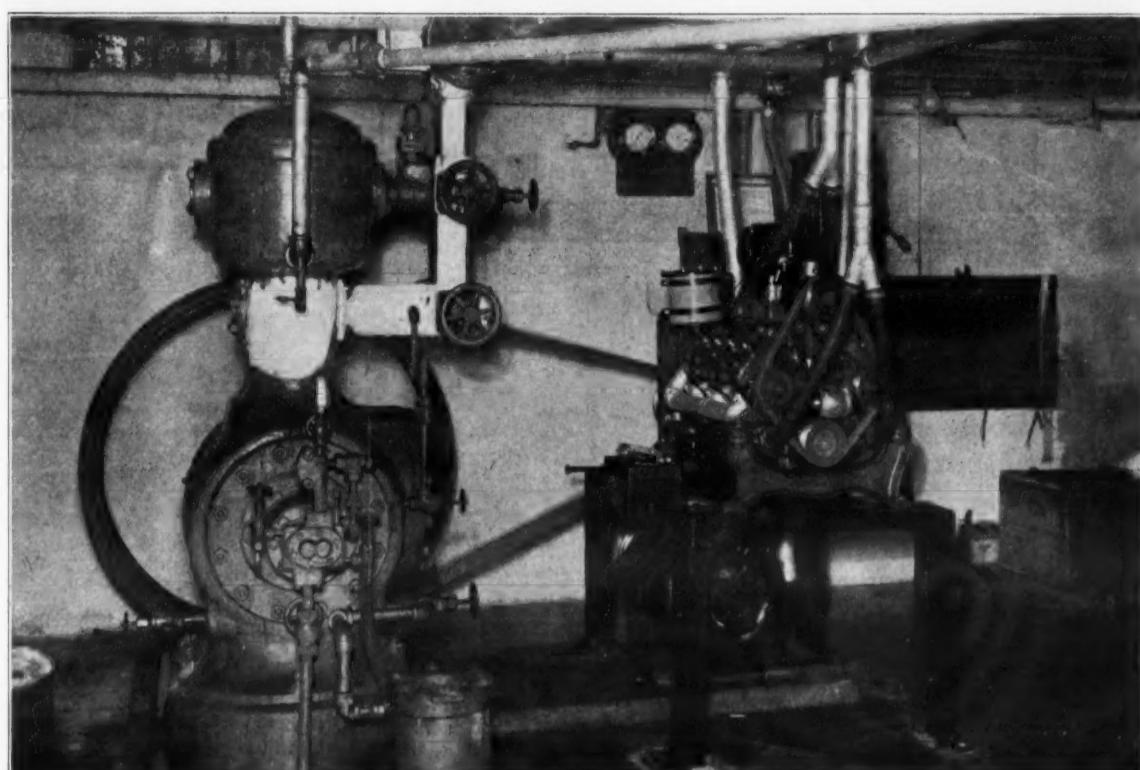
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G. & S. TOOL & MFG. CO.
8790 GRINNELL AVE. DETROIT, MICH.



Two Sources of Power Keep Operating Cost Low



Gas-burning, Ford V-8 engine driving a 25-ton Frick ammonia compressor in the Pfahler Packing Co. plant, Detroit. Note electric motor under engine, used during periods of year when favorable gas rate does not apply.

The Peoples Gas Light and Coke Co. of Chicago offers the following schedule of "off-peak" rates for refrigeration and air-conditioning use:

Per Therm.
Nov. 1 to March 30 (winter) .. 12.00 cents
April and October 4.25 cents
May 1 to Sept. 30 (first 1,500 therms.) 3.00 cents
Same period (all over 1,500 therms.) 2.25 cents

Dallas Gas Co., Dallas, offers the following promotional rate for natural gas engines:

Per Thousand
First 80,000 cu. ft. 50 cents
Next 220,000 cu. ft. 28 cents
Next 220,000 cu. ft. 23 cents
Next 500,000 cu. ft. 18 cents
Next 1,000,000 cu. ft. 15 cents

Another important factor in the figuring of costs is that the water used to cool the refrigerant and the compressor may be conducted through the cooling system of the gas engine and thereby raised to a thermostatically controlled temperature of from 160° F. to 180° F.; then piped to a large storage tank. In the case of packing houses and restaurants, where a large amount of hot water is in constant demand, the entire hot water supply may be obtained in this way. Therefore, in figuring actual costs of operation, it is necessary to charge back the cost of the domestic water supply, no matter what method has been used for heating the water before the gas engine is installed.

TWO TYPES USED

Internal combustion engines powered by natural gas may be divided into two distinct types. The first of these classifications includes the "heavy duty gas engines" built for continuous service and burn natural gas only. These engines applied to installations where 100 hp. and up are required are quite common.

Units of this character are slow in speed, heavy in weight, and very expensive in their initial cost. Life expectancy of these machines is upwards of 20 years of continuous service. While heavy gas engines have many applications, units used for refrigeration and air conditioning fall in the second classification.

From the standpoint of relatively light, intermittent operation, the industrial gasoline engines and small automobile motors may be converted to natural gas and used to drive refrigeration machinery. The advantages of this type of engine are low first cost, adequate horsepower, and ease of installation.

Converted gasoline engines of this type may be connected to any commercial or air-conditioning compressor by means of a V-belt drive when the compressor has approximately the same capacity rating as the engine. Motors of this character are available in capacities ranging from 10 to 300 hp. and heavy-duty units discussed above may be obtained in capacities up to 1,500 hp.

For reasons of initial cost, size,

horsepower, and operating cost, it is seldom advisable to adapt natural gas engines to loads under 20 tons. Jobs ranging from 20 to 100 tons, however, are well adapted to the use of automobile engines converted to natural gas.

Cost of operating the converted automobile engine, while slightly higher than the cost of running the heavy gas engine, is still very reasonable. According to W. G. Durant, of the Lycoming Motor Co., "with a gas rate of 50 cents per 1,000 cu. ft. and a reasonable load factor, the gas, lubricating oil, and maintenance cost of a high quality small generating plant will average approximately 1 cent per kWh."

The main argument advanced by the gas utilities for the use of natural gas engines is lower power costs. According to utility company engineers, the cost of operating a gas engine for one horsepower hour includes 12 cu. ft. of gas, 5 gallons of water, and 3/100 cent for oil.

Water used in cooling the gas engine is obtained from the compressor and condenser, so no extra cost may be attributed to this source. The other costs which must be considered are the gas itself, oil, repairs, depreciation, and maintenance.

Tables issued by the Waukesha Engine Co., Waukesha, Wis., compare the costs of natural gas, oil, gasoline, steam, and electricity. For the purposes of this analysis the tables on natural gas and electricity are reproduced on page 16.

From an examination of Table 1, the cost of operating a 40-hp. job at

3 cents per kWh. is \$1.05. By selecting a 40-hp. job on Table 2 and a gas rate of 50 cents, the operating cost per hour is 27 cents.

It must be remembered, however, that in certain metropolitan areas the electric companies offer a primary power rate to users of large amounts of electricity at less than 1 cent per kilowatt hour. In these cases the cost of electricity and gas is about equal.

For the purpose of comparing rates in any given locality, the cost of electricity and gas must be set up, figuring in any demand charge made for electricity, and making

(Continued on Page 16, Column 3)

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Send for the New
REFRIGERATION CATALOG
Seven Models of Compressors
Fifty-eight Models of High-
sides from $\frac{1}{4}$ H.P. to 15 H.P.
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CADILLAC SQUARE AND BATES STREET
810 OUTSIDE ROOMS
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Display and Storage Equipment for Retail Food Stores

MARSHALL, MICHIGAN

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"Profit-Making Meat Displays"—a new 32-page booklet tells meat merchants how to get greater profits from their displays.

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The latest and finest in refrigeration and air conditioning parts, tools and equipment.

- Our large stocks permit prompt shipment at lowest prices.

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1938 DEPENDABOOK

Everything for Refrigeration in 1938

CHIEFTAIN

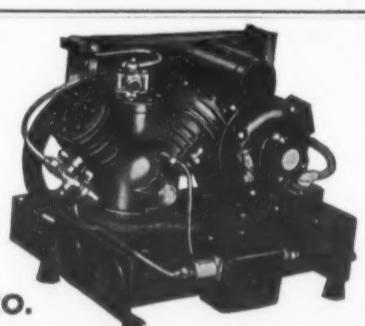
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The CHIEFTAIN line represents precision manufacture and proven service, and is designed for all domestic and light commercial applications.

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TECUMSEH PRODUCTS CO.
TECUMSEH, MICH.



Dayton V-Belts are the logical choice for all types of appliances, because they provide silent, dependable transmission—because their powerful grip prevents slippage—because they run smoothly without weaving, twisting or vibrating. A nearby distributor carries a complete stock.

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THE DAYTON RUBBER MANUFACTURING CO.
DAYTON, OHIO
WORLD'S LARGEST MANUFACTURER OF V-BELTS

Dayton
V-BELTS

Refinements Made in Combustion Engines To Make Them Operate Better with Gas

(Continued from Page 15, Column 5) allowance for depreciation and maintenance of gas engine equipment. Because of the fact that rate structures of both gas and electric companies are of necessity quite complicated, a careful study of both rates is necessary to arrive at actual comparative figures.

2,000 JOBS IN SERVICE

According to a report issued by the "Gas Engine Power Committee" of the American Gas Association for 1937, well over 2,000 gas engines were in use throughout the country. A great many of these motors are used for applications other than air conditioning or refrigeration, but this field represents one potential for equipment of this type.

Installations of natural gas engines are scattered over the entire country in districts where attractive gas rates prevail. These jobs range in application from a second-hand gasoline engine running a line shaft in a machine shop to heavy-duty units used in the generation of electric power.

Certain applications in the refrigeration and air-conditioning industries are of current interest. The Pacific Ice and Cold Storage Co., Dallas, has a 150-hp. Bruce Macbeth engine driving a 12 x 18 ammonia compressor used for making ice. The cost per ton for the manufacture of ice at Dallas rates is estimated at approximately 60 cents. This machine was installed second hand in 1921 and has now seen 30 years of continuous service.

The Morgan Warehouse Cold Storage Co., Dallas, Tex., is using two 165-hp. gas engines used to power two 7 x 7 ammonia compressors. The machines are also connected to a 125 KVA generator which supplies lights and power throughout the building.

As an example of continuous and uninterrupted service, the city of Cardin, Okla., uses two Ford V-8 engines to supply water to the city without benefit of electric stand-by motors. These units have not been out of service for two years, according to utility engineers.

The Capital theater, Dallas, uses three 108-hp. National Transit engines and one 80-hp. engine to power two Freon compressors and to operate generators. The gas engines operate the air-conditioning system in the building and also generate power for projection and theater lighting.

Sears, Roebuck, and Co.'s Dallas store uses gas engines for power and lights, and in addition two 4-cylinder Cooper Bessemer Gas engines are connected to ammonia compressors which are used for air conditioning. The installation was made in 1936.

The Detroit City Gas Co. uses Continental and Ford V-8 engines in three of their substations for driving line shafting, as a booster air compressor, and to operate electric generators.

Ford engines are used to power two 60-hp. Baker Freon compressors in the Beverly theater, Detroit, and are also used to power a 25-ton Frick ammonia compressor in the Pfahler Packing Co.

The Froehlich & Sons Sausage Co., Detroit, uses a 25-hp. Waukesha engine to drive a 25-ton ammonia refrigeration system. In this instance use is made of all hot water coming from the motor, which is stored in a 2,000-gallon tank.

Michigan Trade School, Detroit,

has a used Dodge engine rated at 15-hp. driving a 5-kw. welding generator.

Another refinement which is advisable, but not imperative, is to connect the oil breather opening from the manifold with the air intake on the top of the motor. This connection permits enough oil vapors to flow through the top of the machine to give adequate upper cylinder lubrication.

LONG SERVICE POSSIBLE

Engineers for a major utility have kept one Ford V-8 engine in service for 3,000 hours, which is the equivalent of 90,000 miles. One observation during this extended test was that paraffin base oils were to be preferred to asphaltum base oils. The latter became thick and gummy after long operation while the paraffin base oils maintained a constant viscosity until the time the motor oil was changed. During this period of extended operation the only repairs necessary on the motor was a change of spark plugs at certain intervals.

It should be remembered that small gasoline engines used to burn natural gas are not subjected to the severe use given in an automobile, such as wide variation in speeds, quick starting, exposure to moisture, dirt, dust, dirty oil, dilution of crankcase oil and road shock.

For this reason the life of these motors is much longer than the anticipated life of the auto engine. Natural gas leaves no deposit of carbon in the cylinders or on the valves and after thousands of miles of operation the face of all pistons and cylinder walls look bright and new.

LOAD SELECTION IMPORTANT

Selection of the correct motor for any air-conditioning or refrigeration load is of paramount importance. If the motor runs too fast, it will use an excessive amount of gas, and if it runs too slow the same will be true.

It is important that a motor be selected that will be comparable with the load on the compressor at a normal speed, approximately 1,500 r.p.m. which is the equivalent of pulling an automobile at 30 miles an hour under constant load. As the average automobile engine has a maximum horsepower rating based on 3,600 r.p.m. this fact should be taken into consideration in sizing the job.

In other words, the Ford V-8 having a rating of 85 hp. will handle between 35 and 50 hp. when operating a compressor at normal speeds. Particular care should be taken when a used automobile engine is adapted for service with natural gas to discount not only the rated horsepower of the motor, but to make allowances for the age and condition of the engine used.

Changing of a gasoline engine over to one that will operate with

(Concluded on Page 17, Column 1)

Table 1—Electric Motors

In Table 1, the electric power cost is based on horsepower at the belt assuming an efficiency of 85% for the motor itself, 100% electrical power factor and continuous load operation.

Hp. at Belt	ELECTRIC MOTOR OPERATING COST PER HOUR								
	1 $\frac{1}{2}$	2	Cost of Current, Cents per 2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	5	6	7
10	\$.13	\$.18	\$.22	\$.26	\$.31	\$.35	\$.44	\$.53	\$.62
15	.20	.26	.33	.40	.46	.53	.66	.79	.92
20	.26	.35	.44	.53	.62	.70	.88	1.05	1.23
25	.33	.44	.55	.66	.77	.88	1.10	1.32	1.54
30	.40	.53	.66	.79	.92	1.06	1.32	1.58	1.85
35	.46	.62	.77	.92	1.08	1.23	1.54	1.84	2.15
40	.53	.70	.88	1.05	1.23	1.41	1.76	2.11	2.46
45	.59	.79	.99	1.19	1.38	1.58	1.98	2.37	2.77
50	.66	.88	1.10	1.32	1.54	1.76	2.20	2.64	3.08
60	.79	1.05	1.32	1.58	1.85	1.93	2.64	3.16	3.69
70	.92	1.23	1.54	1.85	2.15	2.46	3.07	3.69	4.30
80	1.05	1.40	1.76	2.11	2.46	2.81	3.51	4.21	4.92
90	1.19	1.58	1.98	2.37	2.77	3.16	3.95	4.74	5.54
100	1.32	1.76	2.20	2.64	3.08	3.52	4.39	5.26	6.15
120	1.58	2.11	2.63	3.16	3.69	4.22	5.27	6.32	7.39
140	1.85	2.46	3.07	3.69	4.31	4.92	6.15	7.38	8.61
160	2.11	2.81	3.52	4.22	4.92	5.63	7.08	8.43	9.85
180	2.37	3.16	3.95	4.75	5.54	6.33	7.90	9.48	11.07
200	2.61	3.52	4.39	5.27	6.15	7.04	8.79	10.53	12.30
225	2.97	3.95	4.94	5.94	6.92	7.91	9.89	11.84	13.84
250	3.30	4.39	5.49	6.59	7.69	8.79	10.99	13.17	15.39
275	3.62	4.83	6.03	7.25	8.48	9.68	12.09	14.48	16.91
300	3.95	5.26	6.59	7.91	9.24	10.55	13.09	15.79	18.44

Table 2—Natural Gas Engines

In calculating the cost of operation with natural gas, the fuel consumption is assumed at 11.5 cu. ft. of gas having a heat value of 1,000 B.t.u. per cubic foot per brake horsepower plus a cost for lubricating oil of 1/10 of a cent per brake horsepower hour.

Hp. at Belt	GAS ENGINE OPERATING COST PER HOUR (1,000 B.T.U. GAS)								
	10	20	30	40	50	60	70		
10	\$.02	\$.03	\$.04	\$.05	\$.07	\$.08	\$.09	\$.12	\$.13
15	.03	.05	.06	.08	.10	.12	.14	.17	.19
20	.04	.06	.09	.11	.14	.16	.18	.21	.22
25	.05	.08	.11	.14	.17	.20	.22	.25	.31
30	.06	.10	.14	.17	.21	.23	.27	.30	.34
35	.07	.12	.15	.20	.23	.28	.31	.36	.44
40	.08	.13	.18	.22	.27	.31	.36	.41	.50
45	.09	.14	.20	.25	.30	.36	.40	.46	.56
50	.1								

THE BUYER'S GUIDE

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Fastest selling line ever offered to the trade. Completely covers the field. Pace-setting values in Top Display and Double Duty Cases—6, 8, 10 and 12 foot lengths... Two shelf cases... Delicatessen cases... Reach-In Boxes... Walk-In Coolers. All streamlined with striking modern beauty and engineered with latest improvements.

With this new Tyler line of commercial refrigerators you can step out ahead of all competition. Write today for free literature and attractive dealer proposition.

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WHITE FOR FREE CATALOG

New A.P. 44

OWN YOUR OWN BUSINESS IN 1938

Are You a REAL Commercial Refrigeration or Fixture Salesman? The H. & H. '38 Direct Dealer Plan Will Put You In Your Own Business. MAKE LARGE DEALER PROFITS, (not small commissions)

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3. Free—forceful mail advertising—DIRECT TO EVERY PROSPECT IN YOUR TERRITORY.
4. To finance the H. & H. products and any nationally known compressor of your selection, both on the same contract with regular down payment and terms.
5. We discount your contracts—converting them into dollars—IMMEDIATE PROFITS TO YOU.

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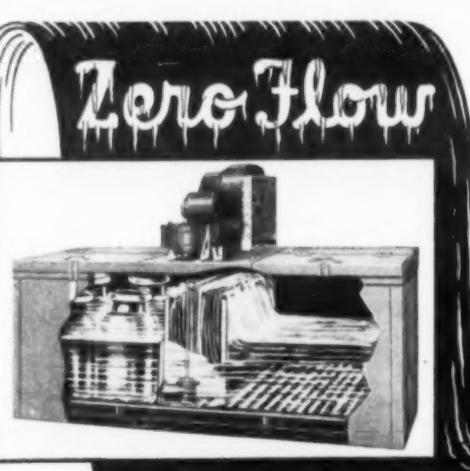
HOLCOMB & HOKE MFG. CO.
1445 E. Van Buren St. Indianapolis, Indiana

50 degrees in 45 minutes at the lowest cooling costs. A distinctive ZERO-FLOW sales point that always clicks with dairymen

And it takes but a single demonstration to prove it. Several features are responsible for ZERO-FLOW's remarkable cooling qualities: greater cooling area (See sales manual for maximum heat transfer due to the continuous flow of water downward and upward over the cooling coils); constant neck-high (A on circular) water level regardless of number of cans; complete, automatic circulation during cooling period; and the most effectively insulated cabinet ever designed for milk cooling. Those are features every milk producer wants. They give results... cut cooling costs to a point that means real savings. Also the ZERO-FLOW cooling unit is placed in the finest looking, most durably built cabinet on the market.

Territories still open for good distributors and dealers to handle the complete line of Wilson coolers... ZERO-FLOW, COLD-WHIRL, VERTI-COIL, Dry Storage.

WRITE FOR DEALER PROPOSITION



WILSON CABINET CORP., Smyrna, Del.

Tips to Housewives on Proper Care of Appliances Are Good Will Builders

(Reprinted with Permission from February, 1938, Issue McCall's Magazine)

REFRIGERATORS

Defrost when frost on the unit is one-fourth inch thick. A heavier coating than this keeps the cold inside the unit and increases cost of operation.

Oil refrigerators that do not have sealed-in mechanism every three to six months with number 20 automobile oil.

Clean the condenser—that part of the mechanism that looks like a finned radiator—with the small nozzle of the vacuum cleaner. A dusty condenser also increases the cost of operation.

Disconnect the refrigerator when you are oiling or cleaning.

Fill ice trays only to within $\frac{1}{4}$ inch of top to prevent sticking. And never use a pick or other sharp instrument to remove a stubborn tray.

Clean and sweeten inside of refrigerator with a mild solution of

little causes clothes to drag instead of float and overloads the machine.

Do not wash a heavier load than manufacturer recommends. Strain on the motor is great and the best job of washing cannot be done.

Keep the strainer of the drain outlet in place. Buttons may get into the pump and cause costly damage. Clean this strainer often.

Lift removable agitator off post after each washing and clean the thread, lint, and excess soap from the agitator shaft, or the agitator may "freeze" into one position.

Remove wringer roll tension when not in use, to prevent sticking. Clean rolls with a soapy cloth or a non-inflammable cleaning fluid. Distribute clothes evenly over the whole length of the wringer rolls to keep the wear on the rolls uniform.

Don't plug in the washer when the agitator, wringer, or spinner is in

Useful Information to Pass on to the User

The information included in this article from "McCall's" magazine might well be passed on to the housewife by service men installing or repairing appliances, and by salesmen upon the delivery of an appliance or while out canvassing. It is the type of instructions which could go onto a tag which might be placed on some part of the appliance.

According to "McCall's," the information presented in the article was compiled from information given by the repair departments of the following public utility companies: Oklahoma Gas & Electric; Detroit Edison; Georgia Power Co.; West Penn Power Co.; Alabama Power Co.; Public Service Co. of Colorado; Los Angeles Bureau of Power & Light; Portland Gas & Electric Co.; Northern States Power Co.

bora or soda and water. Scald freezing trays with borax or soda solution.

Wipe up any spillage immediately, as food acids stain porcelain enamel.

Wash the outside with lukewarm water and mild soap. If the exterior is of lacquer, several good waxings a year will maintain the finish.

Do not pack the refrigerator so full that the cold air cannot circulate freely around each container.

Cover all foods to prevent excessive moisture condensation.

IRONS

Don't drop. Don't cool by placing in water. Do disconnect when you go to answer the door.

Do keep handle bolts and nuts tight and sole plate clean and slick.

Do leave the plug at the iron engaged and disconnect at the wall to save wear on the cord.

VACUUM CLEANERS

Keep brushes free from lint and thread.

Empty dust bag once a week. Once a month turn it inside out and brush.

Oil according to the instructions stamped on most machines. If you have no instructions, every two to four weeks insert two drops of electric motor oil in each oil hole. Too much oil will do as much damage as not enough. Some machines are oiled by the manufacturer for long service.

WASHING MACHINES

Keep water level, when loaded, at the point marked. Too much water may damage the mechanism; too

gear or when the pump is engaged; a blown fuse may result.

Oil the motor and mechanism about every three months according to manufacturer's recommendations.

MIXERS

Oil often, but sparingly, with a good grade of graphite oil.

Pack the gears with a heavy grease about once a year, as recommended by the manufacturer's instructions.

Do not subject porcelain or glass bowls to any very sudden changes in temperature.

Clean motor casing with a damp cloth. Do not immerse it.

Use a rubber scraper to mix down batters. Spoons or other metal utensils may get caught in the beaters and cause serious damage.

Do not try to make your mixer do too heavy work. Let manufacturer's instructions be your guide.

RANGES

Clean clogged ports in burners of gas ranges with a small wire. Do not use toothpicks or slivers of wood. Wash the grillwork and trays with lukewarm water and a mild soap.

Clean open units of electric ranges with a soft brush; never use a fork or instrument to remove crumbs.

Treat porcelain enamel gently because it is really glass. So clean the range when it is cool, to prevent cracking or crazing of the enamel finish. Wash porcelain with mild soap and lukewarm water. Remember that the acids in milk, lemons, and vinegar leave permanent stains.

Clean the oven thoroughly and often to prevent spilled foods or spattered grease from burning into surface.

Prevent boil-overs by using low heat as soon as food starts to boil. Most spillage burns itself off.

Wash metal; polish with dry cloth.

Place heavy utensils gently on the units to prevent breaking the fire brick or chipping the enamel.

C. W. Thurlow Re-enters Service Field

BALTIMORE—Carroll W. Thurlow has reentered the electric refrigeration service business here under the name of Thurlow Electric Service. Mr. Thurlow was engaged in appliance servicing for a number of years before dropping this work to enter other lines of business. He also had conducted an electric refrigeration service school.

SERVICE LETTERS

Correct Cylinders for Various Refrigerants

Kinetic Chemicals, Inc.
Wilmington, Delaware

January 7, 1938

Service Editor:

I have noticed in the December 29 issue of AIR CONDITIONING & REFRIGERATION NEWS on page fourteen your article entitled, "Service Men Should Heed Precautions in Handling Refrigerant Cylinders."

We would like to point out for your information that cylinders used for the shipping of "Freon-12" are made in accordance with I.C.C. specifications 4B300 the same as is used for sulfur dioxide cylinders. We do not use any cylinders made according to I.C.C. specification 4B150 which apply only to methyl chloride.

Our four pound "Freon-12" shipping containers are 9 $\frac{1}{2}$ inches long and are equipped with a fuse plug in the standard Kerotest valve which is common to all of the various size "Freon-12" shipping containers.

At such time as you have an opportunity in your various articles we believe that it would be a good idea to pass on the word to the men in the field that a "Freon-12" cylinder or, in fact, any cylinder used for handling compressed gases should never be heated to a temperature of higher than 125° F. assuming, of course, that the cylinder has been charged at a normal room temperature of approximately 70° F.

This figure of 125° F. is the maximum temperature recommended by the Compressed Gas Manufacturers' Association and appeared in their bulletin dated February 4, 1936.

R. J. THOMPSON,
Refrigeration Engineer.

Answer: The author of the article is familiar with the fact that Freon-12 cylinders owned by Kinetic Chemicals, Inc. are made in accordance with I.C.C. specification 4B300. Also that your small cylinders are equipped with a fusible metal safety device, although it is not required by law.

Some of the readers may be puzzled about I.C.C. test pressure requirements on cylinders being higher for sulphur dioxide than for methyl chloride and Freon-12; especially when sulphur dioxide has a lower vapor pressure at a given temperature than does either of the other two refrigerants.

The reason advanced by I.C.C. is that sulphur dioxide is considered to be a corrosive refrigerant when in contact with moisture. The extra thickness of the cylinder wall is purely an added safety factor to compensate for thinning by corrosion.

CLASSIFIED ADVERTISING

RATES: Fifty words or less in 6-point light-face type only, one insertion, \$2.00, additional words four cents each. Three insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Air Conditioning and Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS WANTED

AIR CONDITIONING sales engineer. Widely experienced in air conditioning distributor contacts for leading manufacturer during the past 6 years. Fourteen years' previous experience in refrigeration sales development. Seeks new connection representing top flight manufacturer for distributor-dealer development in Southwestern area. Thoroughly familiar with territory from Mississippi west. Available immediately. Box 1008, Air Conditioning & Refrigeration News.

BUSINESS FOR SALE

REFRIGERATION, AIR CONDITIONING and Radio Business. Western Kansas county seat town. Stock and complete test equipment. Average yearly volume \$15,000. Less than \$1,000 needed for cash sale. Box 1009, Air Conditioning & Refrigeration News.

REPAIR SERVICE

DOMESTIC CONTROLS repaired. Ranco pencil types \$1.75. General Electric, Cutler-Hammer, Tag, Penn, Ranco box types \$2.00. Bishop Babcock, Majestic, Penn magnetic types \$2.50. Mayson and Detroit valves \$1.15. Thermostatic expansion valves \$3.50. All calibrated to factory specifications. UNITED SPEEDOMETER REPAIR COMPANY, 436 West 57th Street, New York City.

PATENTS

HAVE YOUR patent work done by a specialist. I have had more than 25 years' experience in refrigeration engineering. Prompt searches and reports. Reasonable fees. H. R. VAN DEVENTER (ASRE), Patent Attorney, 342 Madison Avenue, New York City.

Service Methods

Check Valve Will Avoid Frequent Change In Pressurestat Setting for Multiple System

BY K. M. NEWCUM

SUCTION line check valves prevent the suction gas from flowing from the warmer to the colder evaporators in two-temperature multiple systems, and consequently permit closer control of the temperature in each refrigerator.

In any two-temperature multiple system where the lowest temperature fixture is controlled by a low-pressure control at the compressor and the other higher-temperature evaporators are controlled by some two-temperature device, there is a possibility that the pressurestat setting may have to be adjusted to compensate for seasonal temperature changes.

TENDENCY TO UNBALANCE

Variations in the service loads on the several refrigerators also have a tendency to unbalance the system, often requiring readjustment of the pressurestat and possibly the two-temperature devices.

The most extreme two-temperature installation, where suction line check valves have been the answer to many service headaches, is a soda fountain. Most soda fountains have an ice cream compartment, and a sweet water compartment. The ice cream coil may operate at 10° below zero; the sweet water coil at 35° F.

The pressure (and temperature) difference between -10° F. and 35° F. is generally maintained by a constant-pressure valve installed in the suction line of the sweet water coil.

During the running cycle the constant-pressure valve throttles the gas leaving the sweet water bath coil, thus maintaining the higher pressure.

CAUSES BAD CONDITION

The constant-pressure valve does not close off tightly and during the off cycle higher pressure gas passes via the suction line over into the

colder ice cream coil. The ice cream coil is sufficiently cold to allow the gas from the warmer coil to condense.

Result is that the pressure built up in the sweet water coil, as the water temperature increases, does not respond on the low-pressure control. Consequently the compressor remains off until the ice cream coil has finally warmed up enough to cut the switch in.

This causes two undesirable conditions: first, the drinking water temperature increases to above the desired degree. Second, the cut-in point on the low-pressure control must be changed to conform to seasonal weather and tap water temperature changes.

WHAT CHECK VALVE DOES

Installation of a sensitive check valve in the suction line of the ice cream coil checks the suction gas from the sweet water coil. Result is that the pressure, created by an increase in temperature of the water coil, is prevented from entering the ice cream coil and must respond on the low-pressure switch to cause it to cut in when refrigeration is required.

When the check valve is installed the pressurestat can be adjusted to maintain the desired ice cream temperature and water temperature and the adjustment will serve for all seasonal conditions.

Use of a check valve is equally important in any multiple system where evaporator temperatures vary more than a few degrees.

RECOMMENDED USE

Its use is also recommended in two-temperature systems using snap-action or thermostat-solenoid two-temperature hookups.

Each of these two-temperature hookups is understood to maintain an independent pressure or pressure

and temperature cycle on the evaporators it controls. The colder evaporator or evaporators are controlled by the pressurestat.

If, however, in a two-temperature system using, for example, a snap-action valve, the snap-action valve cuts in (opens) about the time the compressor has completed its running cycle on the colder evaporator, the higher pressure gas passes into the colder evaporator.

Consequently the temperature of the controlled refrigerator increases, until the combined pressures of both the colder and controlled evaporators rise to the cut-in point of the pressurestat.

Often the delayed starting of the compressor allows the temperature of the controlled refrigerator to rise to a dangerously high degree.

In cases of this nature service men have a tendency to lower the cut-in point of the pressurestat, or cut-in point of the snap-action valve or both.

LOWERING CUT-IN

Lowering the cut-in point of the pressurestat usually results in frosting of both evaporators due to the shortened off-cycle.

Lowering the cut-in point of the snap-action valve results in frosting of the controlled evaporator, because the snap-action valve does not always cut in at the end of the running cycle.

It may, depending entirely upon the temperature and pressure of the controlled evaporator, cut in during the running cycle or at the start of the running cycle. In this event the coil does not defrost. The controlled coil might defrost if it cut in just after the compressor had completed its running cycle.

A check valve installed in the suction line of the colder coil will force the pressure exerted by the opening of the snap-action valve to cut the control in and the controlled evaporator then actually operates on an independent cycle.

Where several controlled (varying temperature) evaporators are used, a check valve should be installed in the suction line of all the evaporators, except possibly the coldest one.

There are times in the cycles of several evaporators when the so-called colder evaporator may be warmer than some of the so-called warmer (controlled) evaporators.

BEST LOCATION

Considering the service expense involved in adjusting a multiple temperature job and the relative low cost of check valves it is considered good practice to install a check valve in the suction line of each coil regardless of its temperature relation to other coils.

Check valves should always be installed as near the evaporator as possible. Some service men use them in place of a union in connecting the suction line to the tail end of the evaporator.

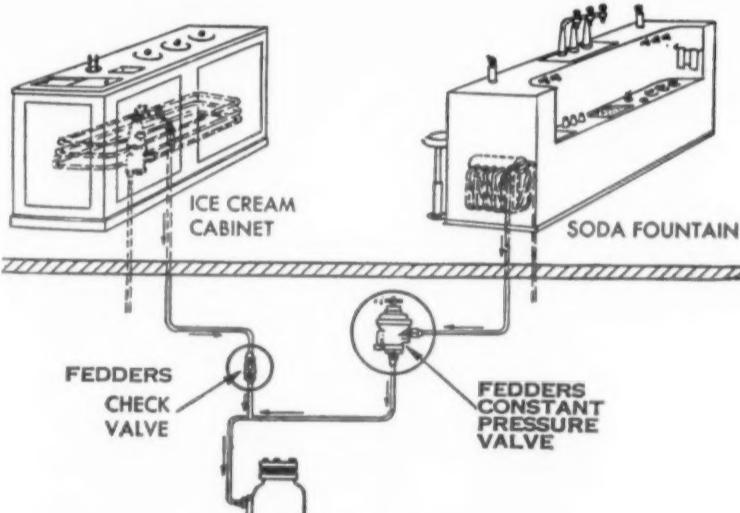
Check valves made especially for refrigeration service have a small (hair) spring that closes the valve when the pressure on each side of the valve is equal. The valves cause little pressure drop in the suction line. They may be installed either horizontally or vertically, whichever is most convenient.

**Allen-Bradley Transfers
Cincinnati Office**

CINCINNATI—Local office of the Allen-Bradley Co., Milwaukee, has been transferred from the Cincinnati Terminal Warehouse to larger quarters at 2331 Reading Rd.

W. L. Jaeckel is district manager.

Installation of Check Valve



Check valve is placed at outlet of lower-temperature evaporator and constant-pressure valve at outlet of the higher-temperature evaporator.

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THE BUYER'S GUIDE

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No. 406-F Tube Bender

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"THE OLDEST FIRM OF RUBBER FABRIC BELT SPECIALISTS"

Will not turn over in the groove. Lasts longer — Runs quietly under pulsating compressor loads. Send for free catalog.

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KOCH
No. Kansas City, Mo.

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"Built Right to Stay Tight"

Every style and size of forged flared tube fitting for the refrigeration industry is available from standard stock at Commonwealth.

Thousands of semi-standard patterns enable us to quickly furnish any desired variation in pipe and tube ends.

Special fittings made to order.

Commonwealth fittings are correctly designed, carefully machined, and tube seats are protected in shipping.

25 years of service to the industry.

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